S.8
558a

1S

JULY 1963

Soil Conservation

ETROIT PUBLIC
JUL 17 1963
TECHNOLOGY & SCIENCE

SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE

VOL. XXVII, NO. 12 JULY 1963

CONTENTS

Page

267 Conservation Program Makes Idaho Ranch Pay
By Clarence Hedrick

268 Watershed Dams Provide Better County Roadways
By C. W. Chapman

270 Great Plains Program Drought-Proofs Ranch
By Walter N. Parmeter

271 Conservation on Defense Lands
By Ella P. Wilkin

272 Conservation Safeguards Historic Pepper Fields
By Leon J. Sisk

274 Iowa County Pushes Roadside Erosion Control
By John G. Wilson

275 Dugouts Save Water for Nebraska Farms
By James McDowell

276 Soil Surveys Basis for Land Assessments
By Leonard A. Anker

277 Conservation Land Patterns Draw Waterfowl
By Charles Slaton

278 Fishing Profits From Once Useless Land
By Carl H. Thomas and John Cross

279 Water on Wheels
By John K. Hortin

280 Converts Idle Land To Recreation Center
By Christopher G. Moustakis

281 Nature Centers—Laboratories for Land Learning
By Herbert I. Jones

283 Borrow Pit Makes Good Archery Range
By R. L. Hall

284 Conservation—A Profitable Way of Life
By William Ross

285 Irrigation Improvement Assures Good Hay Yields
By J. E. Preston

286 From Boxing To Ranching—A Profile
By C. Dale Jaedicke

287 Book Reviews

Soil Conservation
25 Years Ago

"Agricultural land-use programs must look beyond agriculture. They must consider all land uses; those that employ the city workers directly and indirectly as well as those that employ the people on the farms. Agricultural land policy cannot be bounded by the farms, ranches, and forests, or even by the rural population; it should formulate alternative programs, one for the possibility that industrial revival will shortly restore the movement of population away from the farms and toward the cities, and another for the possibility that it will not. In the first case land not suited to farming can be shifted readily, as funds and other facilities permit, to forest, recreation, and wildlife purposes. In the second case, the shifting will meet with considerable resistance and will need to be coupled with relocation programs and with special programs for relatively noncommercial agriculture. Agriculture is not in a position to solve industry's problem; but it cannot deal with the farmland problem without reference to urban conditions."

COVER PICTURE—This contour stripcropping and sod waterway on C. J. Cavalier & Son Farm, Martinsburg, W. Va., is typical of conservation measures to be seen any July throughout the country. Photo by James H. Conklyn.

Soil Conservation

ORVILLE L. FREEMAN
Secretary of Agriculture

DONALD A. WILLIAMS
Administrator, Soil Conservation Service

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget, June 26, 1958.

FRANK B. HARPER, Editor

FOREIGN—$2.25 PER YEAR

25 percent discount on orders of 100 or more mailed to one address.

15 CENTS PER COPY $1.50 PER YEAR

All orders for paid subscriptions go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Conservation Program Makes Idaho Ranch Pay

By Clarence Hedrick

Ellis Fuller explains conservation ranch plan during annual SCD tour.

A COMPLETE soil and water conservation plan enabled Idaho rancher Ellis Fuller to take a depleted 640-acre ranch and develop it in 10 years into a well balanced economic ranch enterprise that shows a profit even in the most severe drought years.

Following World War II, Fuller rented 200 acres of farmland near Twin Falls. Since that time, he has purchased this land and an additional 440 acres of adjacent dry grazing land.

From 1945 to 1952, Fuller ran 12 head of cattle on the 640-acre unit. He cropped 200 acres, all of which was irrigated. Crops were beans, peas, and alfalfa-hay. Beans and peas totaled about 160 of the 200 acres.

Fuller's operation was complicated because his ranch is in an area where there is a shortage of irrigation water 8 out of every 10 years. The irrigation system on the ranch needed revision. All irrigation runs were at least ¼ mile long, and water losses were excessive. Fuller says that from 1945 to 1952 his farming operation was poor, and that if he hadn't done custom work away from his ranch he would not still be in the ranching business.

In 1952 when the Twin Falls Soil Conservation District program was brought to Fuller's attention, he developed a complete soil and water conservation ranch plan with the help of the Soil Conservation Service. The main object of this plan was to treat each acre of land according to its capability, obtain maximum efficiency from available irrigation water, increase soil fertility, lower production costs, and bring about a more stable ranch enterprise.

The first step was to make a complete appraisal of soil, water, and plant resources. Irrigation water records, soil, land capability, range site and condition, and engineering surveys were used.

To make most efficient use of available irrigation water, the plan called for a completely revised irrigation system. Irrigation runs were reduced in length from ¼ mile to 680 feet. Concrete pipelines, lined ditches, water-control structures, and land-leveling practices were installed according to engineering design and specifications. An additional 30 acres of land is now being irrigated.

To boost soil fertility it was planned to increase the acreage of soil-building crops and decrease the soil-depleting crops. This was accomplished by increasing the acreage of alfalfa-grass hay. Irrigated pasture and grass for seed production replaced some cash crop acres such as beans and peas.

The next step planned was the improvement of all rangelands. To accomplish this it was necessary to eradicate sagebrush and annual weeds, prepare a seedbed, and seed adapted dryland range grass on all rangelands. Water for livestock had to be developed and each unit fenced, so a rotational deferred grazing schedule could be followed.

About 80 percent of all conservation practices planned by Fuller in 1952 have been applied. He is now running about 110 head of

Cattle grazing one of Fuller's rangeland units.

The author is work unit conservationist, Soil Conservation Service, Twin Falls, Idaho.

Concrete-lined ditch and siphon tubes in revised irrigation system.

Alfalfa-grass hay ready to be stacked for winter feeding.

Angus cattle, with year around forage. Cash crops of beans and peas have been reduced by 30 to 40 acres. Grass for seed production and irrigated pasture has been put on lands previously used for cash crops. His ranch is known as a show place of a complete soil and water conservation program in action.

Watershed Dams Provide Better County Roadways

By C. W. Chapman

STEPHENS County, Ga., officials figure the county saved money when it paid for widening watershed dams in order to route a county road over them.

"We don't ask why, any more; we just want to know how," Chairman Willie G. Sheriff of the County Board of Commissioners explained in talking about work on two Broad River watershed projects.

Road work on the North Fork of Broad River watershed, the pilot project, is nearly complete. Similar work is getting well under way on the North Broad River watershed, a watershed protection and flood prevention project authorized for operations 2 years ago. The programs are similar, including the cooperation between the Federal and county governments and the local people. In every case, the new road has been shorter, straighter, and safer for the public to travel. Bridges have been eliminated that, with their approaches in the valleys, had been subject to frequent damage by floods, with resultant high maintenance costs.

"With the new dams they are safe from flooding, no bridges have to be replaced, and none of the road is in the 'swamps,' so we reduce maintenance costs," Sheriff added. "More maintenance money is saved by vegetative protection given the shoulders of the roads and the back slopes under the watershed program."

Commissioner Sheriff still likes to take a turn on the tractor.

The author is State conservationist, Soil Conservation Service, Athens, Ga.

In one case, the county built a higher road bed to permit the construction of a flood-detention reservoir. Last year, the county furnished labor and equipment to plant grasses and lespedeza on the roadbanks of nearly 50 miles of county roads. This outlay represented at least 50 percent of the cost. The watershed program supplied the seed and fertilizer.

Sheriff is a farmer and a businessman. He owns land in the watershed, and is an earthmoving contractor.

"I have become so conscious of erosion that I never let a new construction job—either county or private—lie bare any longer than necessary," he said. "As soon as we shape a new road, or reshape an old one, we plant grass. When we come back later to lay the blacktop we may destroy some of the grass and have to replant. But the expense is not great, and the protection we get is worth the cost."

Almost all of the landowners cooperate. The work done on private farms is the basic part of the program. Farmers plant trees and grass, heal gullies, put conservation practices on their lands, and give the right to use whatever land is needed for flood-detention reservoirs, channel improvement, or roadside protection.

"Only kudzu can control erosion on the high, vertical banks, but it is objectionable to many people," Commissioner Sheriff pointed out. "In many cases, they set their fences back so we can slope the roadbanks and use the better kinds of grasses and legumes.

"Our people take a great pride in their communities, including the appearance of the roadsides. I think it is at least partly due to the great improvements made on the pilot watershed since work began in 1955. When the appearance of one community is improved by road work, other groups ask for the same help. I think the women have a lot to do with that. Perhaps they notice the things that beautify their communities more than the men do."

Roadside gullies caused by years of waterflow from adjacent cultivated field.

3-year-old kudzu and lovegrass healing the gullies.

Sheriff said there is now so much demand for road improvement that he can select his jobs where the people are willing to give enough right-of-way for proper bank sloping.

"Where there are holdouts, we just wait for the community spirit to act," he said. "Then when everyone is ready to help do a good job, we put that community road on the schedule. We don't need to condemn right-of-way for county roads. We never lack for opportunities to do first-class road jobs.

"This county has learned that we get nothing but benefits from the watershed program. We get planning and technical help from the Soil Conservation Service, and through their small-watershed programs we get much financial help.

"Their programs have proved themselves in the control of erosion, in the reduction of sediment and flood damage, in the reclamation of fertile bottom lands, and in the resulting improvement in the economy—as well as the beauty—of the county."

Great Plains Program Drought-Proofs Ranch

By Walter N. Parmeter

COOPERATOR Walter Dennis in the Jackson-Washabaugh Soil and Water Conservation District in South Dakota credits his ranching success to his Great Plains Conservation Program.

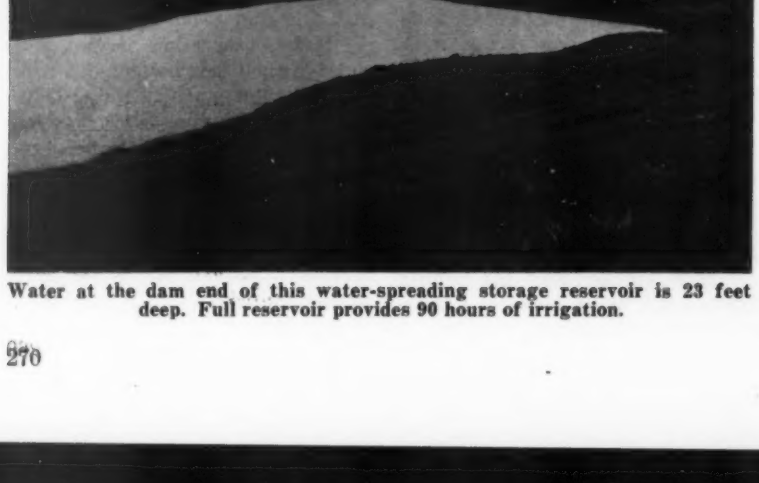
"My conservation plan under the Great Plains Program drought-proofed my 'Target Ranch'," is the way he puts it.

The "Target Ranch" got its name because of a large target Dennis hung below his registered Hereford sign alongside the road so those who must shoot at signs will use the target instead.

The Dennises not only run some 260 head of registered Hereford cattle, but also raise registered quarter horses. Dennis, a tall soft-spoken rancher from Sansaba in central Texas, has not bought feed for his livestock during the past 2 years, and has had ample carry-over to last for two seasons.

Walter Dennis points out how marksmen have used his target and spared his ranch sign.

Registered Hereford cattle fatten on Dennis' good grass.



Water at the dam end of this water-spreading storage reservoir is 23 feet deep. Full reservoir provides 90 hours of irrigation.

Soil Conservation Service technicians assisting the Jackson-Washabaugh district helped him develop his conservation plan, which now consists of two water-spreading systems on the first bench of the White River, 18 stockwater dams, 2 stockwater wells—1 equipped with electric pump—2 large dams for water spreading, and 2 flood-water-detention dams.

Of the 5,600 acres in the Dennis ranch, 4,000 acres are in one watershed. In 1957, before the Great Plains program was started, 130 acres of hay were cut on the White River bottom. A rainstorm in this large watershed sent enough water over the bottom to wash this complete crop down the river. Because of the frequent droughts, hay crops were often short, and Dennis had to buy hay when there wasn't any hay for sale in the county.

"With my Great Plains conservation ranch plan in operation," he said, "I now have as much as 300 tons of hay carry-over.

"The water in the large watershed is impounded each spring, and in late October or early November I open the 15-inch gate in this dam

The author is conservation agronomist, Soil Conservation Service, Huron, S. Dak.

and irrigate my native grass and alfalfa on the 130 acres of bottom land through a water-spreading system. When the reservoir is full, I have 23 feet of water in the dam, and it backs up in the valley ¼ to ½ a mile. It takes 90 hours of steady irrigation to empty the system in the fall."

The native hay on the bottom is composed of western wheatgrass, green needlegrass, prairie sandreed, some switchgrass, and big bluestem. The production on this bottom land was increased by drilling in 10 pounds of Ladak alfalfa an acre in the spring as soon as it was dry enough to use a drill.

Under his Great Plains plan, 400 acres of Dennis' rangeland was scheduled to be reseeded; but when it was deferred from grazing, it made such rapid improvement that it now appears reseeding will be unnecessary. All of the rangeland now has proper range use, and most of it is in excellent condition.

Dennis also practices rotational deferment grazing with nine large pastures and 14 miles of cross fence—out of a total of 26 miles of fence on his place. These cross fences give him 15 pastures ranging from 40 to 1,350 acres. Each pasture has stockwater, salt, and one or more oiling systems to control livestock flies.

"Operating under a Great Plains conservation plan, my whole ranch has a new value," Dennis says. "If the upland is worth $30 an acre, the hay bottom with the spreader systems is worth $300 to $500 an acre. Under this system, I feel secure in the years to come."

Conservation on Defense Lands

By Ella P. Wilkin

THE Departments of Defense and Agriculture will work together for the conservation of forest and soil and water resources on lands administered by the Department of Defense under an agreement signed by Secretary of Defense Robert S. McNamara and Secretary of Agriculture Orville L. Freeman.

The U. S. Department of Agriculture will cooperate in the development and furtherance of Department of Defense conservation programs at military installations, reservoir projects, and other facilities. The Defense Department will have available to it, through USDA's Forest Service, Soil Conservation Service, and Agricultural Research Service, technical assistance, advice, and special research needed in determining suitability of soils for special uses and in applying conservation measures on its lands. The Department of Defense will reciprocate by providing services and facilities useful to the USDA agencies.

Secretary Freeman said in signing the agreement at the Pentagon, Washington, D. C., on March 27, 1963:

"This agreement will provide better conservation of natural resources as well as a savings to the taxpayers. The military will continue to help us in fighting forest fires and providing us with their aerial maps for a wide variety of survey purposes. We will reciprocate by providing technical assistance to conserve soil and water resources on public lands administered by Defense. I believe our technicians can provide a highly

Secretary of Defense McNamara looks on as Secretary of Agriculture Freeman signs conservation agreement.

The author is information specialist, Soil Conservation Service, Washington, D. C.

necessary service which otherwise would require hiring special personnel for the job."

Secretary McNamara pointed out that the agreement "recognizes the close working relationship of our two Departments and the vital need for conservation of our forest, vegetative cover, soil, water, and related natural resources to meet the needs of future generations on lands entrusted to our care."

"Natural resources are not only vital to the welfare of the American people," he added, "but their conservation and wise use is an important part of our national security."

Conservation Safeguards Historic Pepper Fields

By Leon J. Sisk

AVERY ISLAND in the heart of the Louisiana Evangeline country combines fairyland beauty with 20th century industry but is most widely known for the production of tabasco sauce from peppers grown on the lowland that forms the perimeter of this "Wonder Island."

Industry-wise, it is the site of the oldest salt mine in the Western world and of a producing oil field. On the esthetic side are Bird City and Jungle Garden, both the creation of the late Edward Avery "M'sieu Ned" McIlhenny, descendant of John Marsh, the original grantee of Avery Island in 1703.

About the turn of the century when the snowy egret was nearing extinction from being slaughtered to provide plumes for women's hats, M'sieu Ned got legislation passed protecting the egret, and then created a nesting sanctuary on the island that formed the nucleus of a colony which today numbers more than 100,000 of these birds. He also collected rare plants and shrubs from all over the world, which went into the island's fabulous Jungle Garden.

"We have to grow pepper on this lowland," President Walter McIlhenny of the producing company says, "because the interior of the island is too rough. Also it is our belief that the land where we are growing pepper produces pepper of better quality and better flavor. The variety of pepper from which tabasco sauce is made was developed on Avery Island and has been grown on the same fields for longer than 100 years. If we allowed the pepper fields to be destroyed we'd be in a serious predicament. Soil conservation is our insurance against that happening."

Only 12 miles from the Gulf of Mexico, and surrounded by swamp and marsh, Avery Island actually is a geological formation known as a salt dome, thrust up for some 150 feet above the surrounding area. The dome is reported to extend to a depth of 8 to 10 miles. Nearly 2,000 acres above sea level

Pepper growing in strips between terraces that empty into grassed waterway, with section of a "deer gap" left of fence.

The author is field information specialist, Soil Conservation Service, Spartanburg, S. C.

forming the highland, it is covered by a relatively thin layer of soil.

For 100 years or more, sugarcane was the principal crop on the island. During this era, enough soil washed from the highland to build a road around the island 12 feet wide and 4 feet higher than the adjacent cultivated fields; but the greater part of the soil that was lost washed into the swamp and marsh.

Ned Simmons, vice president of the company, developed a conservation plan for the island, with the help of Dolan Kleinpeter, Soil Conservation Service soil conservationist assisting the Iberia-Vermilion Soil Conservation District. Simmons' first concern was to keep the runoff from the central highlands off the pepper fields. This was done by putting in a diversion ditch above the fields. At intervals along the diversion, drop-inlet structures of concrete and steel lower the water under the road and into grassed waterways, where it is safely conducted to the swamp.

The next problem was to keep the water that falls directly on the pepper fields from damaging the land. This was done by a combination of land leveling, parallel terracing, proper row arrangement, sodded V-drains, crop rotation, cover crops, and the use of crop residues. Conservation has been extended to all parts of the farm—the central highlands, the pepper fields, and the swampland and marsh.

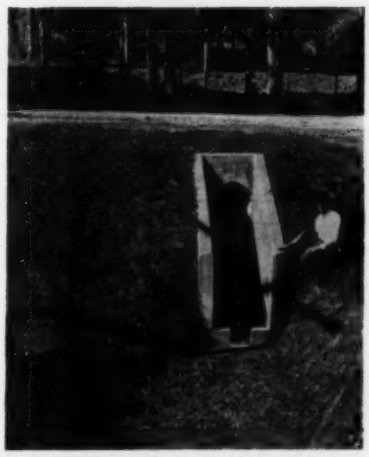
In the marsh, measures have been installed where feasible, to regulate the quality and quantity of water, thereby improving the habitat for waterfowl and other wildlife. Simmons also is encouraging the propagation and growth of desirable food plants and feeding conditions for marsh wildlife.

The entire island is managed for wildlife and teems with deer, wild turkey, quail, and many species of small game. The pepper fields are fenced to keep the deer out, but Simmons has provided 100-foot-wide, grassed "deer gaps" between the fields to facilitate the passage of the deer from the swamp and marsh areas to the interior of the island.

"It was because of this conservation heritage, and a deep personal conviction on my part of the importance of conservation, that we got a practical conservation plan for the island," Simmons says. "But we'd been practicing soil conservation long before that. I have a land use map that was used by M'sieu Ned at the beginning of the century, that shows how the land was being used. Even then all cultivation was on the contour, when no one else in this part of the State had ever heard of the practice. M'sieu Ned's map not only shows it; the evidence can still be seen on the land."

"While we have a family feeling for the island, and want to keep its resources intact," McIlhenny adds, "I'm frank to say that looking at it from another angle soil conservation is also a cold dollars and cents proposition with us. I'd be less than honest if I didn't admit that. We've got to practice conservation if we stay in the tabasco business, whether we want to or not."

Pepper ready for harvest is checked by Dolan Kleinpeter (r.) and Tom McGourin of SCS.



Concrete structure that drops water from diversion ditch into grassed waterway.

One of the Avery Island farm ponds that are used to irrigate peppers during droughts.

Iowa County Pushes Roadside Erosion Control

By John G. Wilson

Untreated side of road showing continuing erosion on back slope and in ditch.

ROADSIDE erosion control and beautification is taking hold in Iowa's Jasper County Soil and Water Conservation District. The district has demonstrated the fact that crownvetch will stabilize steep roadside back slopes and check erosion while adding beauty for the highway motorist. This means that many tax dollars now spent for maintenance on county highway systems well may be saved by a coordinated erosion control program carried out in cooperation with adjacent landowners.

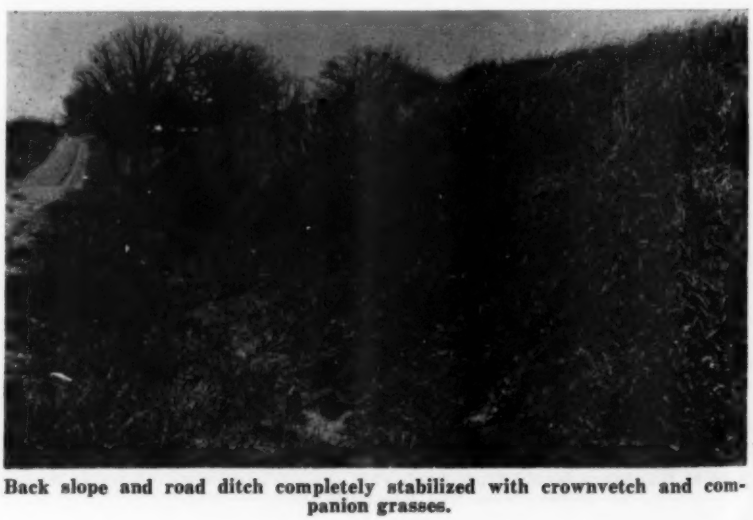
In the spring of 1960, a new road adjacent to the late Fred Maytag II property was graded by the city of Newton. An unusually steep back slope was developed, making it impossible to operate with power equipment in preparing a seedbed. Also, such a slope could not be maintained by mowing with ordinary equipment.

Maytag farms were early cooperators with the Jasper district in developing extensive soil and water conservation plans, and Maytag turned to the district for help on this newly created problem. Soil Conservation Service technicians working with the district agreed to furnish part of the labor, with the landowner supplying the materials and the rest of the labor needed to demonstrate roadside erosion control and beautification.

The soil on the back slope was hand raked to prepare a seedbed and create a roughened surface so seed would remain in place. An application of 0-20-0 fertilizer was made at the rate of 400 pounds to the acre, followed by seeding of 15 pounds of crownvetch and 10 pounds of alta fescue an acre. To keep surface rilling from occurring in case of water runoff and to provide insurance for holding moisture, a straw mulch at the rate of 3 tons an acre was used, held in place by use of mulchnet stapled to the slope.

To make the demonstration complete, the adjacent roadside ditch and fore slope were fertilized and seeded with a mixture of 10 pounds of bromegrass and 10 pounds of alta fescue to the acre, with oats as a cover crop. Also, on the steeper grade of the ditch, Reed canarygrass was transplanted and an erosionet used to assure stabilization against erosion until sod established itself.

By 1962, the entire area was well established with vegetative cover. The steep back slope had



Back slope and road ditch completely stabilized with crownvetch and companion grasses.

The author is work unit conservationist, Soil Conservation Service, Newton, Iowa.

noticeably dense cover from the spread of the rhizinous root system and new shoots of the crownvetch. Complementing this dense cover, thousands of purplish blue flowers provide beauty to what could otherwise have been a barren and ugly eroded area. The opposite side of the road, which was not treated, makes this fact vividly stand out to passing motorists.

The demonstration has been used by the Jasper district as an example to encourage the County Board of Supervisors to carry out an expanded erosion control and beautification program. An average of about 10 miles of road is regraded each year in the county. Seed is furnished the farmers adjacent to these new grades; and the farmers in turn provide the labor for seeding and maintenance, by mowing after establishment, on all but the problem areas. These areas will be given special attention by the supervisors.

Dugouts Save Water For Nebraska Farms

By James McDowell

NEBRASKA farmers are digging, not for gold or oil, but for something to them as precious —water.

The "holes" that result are called sumps, pits, or dugouts. Each is part of a tailwater recovery system which allows the farmer to reuse irrigation runoff previously wasted.

In 1961, the Agricultural Conservation and Stabilization Service approved the practice for cost-sharing in eight south-central Nebraska counties. Since then, 55 or more dugouts have been dug in the Fillmore County Soil and Water Conservation District alone.

The pits are dug where they can intercept waste water from irrigated fields. This is usually just off the side of a low spot where the drainage leaves the field or farm. Where possible, the dugout is located so that floodwater will bypass the hole and only comparatively silt-free water can enter.

Cost-sharing covers about half the cost of construction, particularly if the dirt doesn't have to be transported too far away from the hole. Soil Conservation Service technicians help the farmer spot the best location for the dugout. They usually find uses for the extra earth, such as leveling a field, building up a pipe lateral, filling a washout, or building a road to the well.

The pits are designed to store enough water to allow for at least a full day's irrigation with a booster pump. In most cases, the water pumped from the dugouts is better than when it comes from the well. It is quite a bit warmer, and it often has some dissolved fertilizer picked up along the way.

There are other potential benefits from these ponds. Many are large enough to be used as private fishing and duck-hunting ponds. Most are being built on farms with terrain too flat for the conventional dam, but these quarter-acre ponds usually are wide enough and deep enough to suit the purpose. Biologists see in each of these ponds a potential nesting area for a pair of ducks.

The ponds supply livestock water when fields are being pastured. They also may be a source of rural fire protection, and have additional value for ground-water recharge.

An important byproduct is the new peace and harmony the dugouts are bringing into neighborhoods where individuals have called attorneys to ask: "What can I do about my neighbor's irrigation water running across my farm?" Nebraska farmers are discovering that irrigation pits offer a practical profitable solution.

Thirsty corn gets its first drink from irrigation pit on F. J. Kimbrough farm near Geneva, Nebr.

The author is work unit conservationist, Soil Conservation Service, Geneva, Nebr.

Soil Surveys Basis For Land Assessments

By Leonard A. Anker

A VOLUMINOUS publication titled "Soil Survey of Carson Valley Area, Nevada," is in preparation for publication and distribution in Douglas County. Although not intended as a best seller, parts of it already have been useful to officials and residents of the Carson Valley Soil Conservation District:

It has aided farmers in planning best use of their soils. It has been used in assessing agricultural lands, and is now considered as one of the bases for water distribution by the Carson Water Subconservancy District.

These are just a few of the uses made already of the soil survey information mapped by the Soil Conservation Service. An agreement to finance a soil survey in the Carson Valley area of western Nevada was signed in the late summer of 1958 by Marvin Settelmeyer, chairman of the Douglas County Commissioners, Roy Godecke, then chairman of the Carson Valley district, and C. W. Cleary, Jr., State Conservationist of SCS.

Assessment map shows area of each soil and its code name.

Cold weather and other difficulties delayed completion of the fieldwork until 1959, and some delay occurred when it was decided to add lands across the California-Nevada State line. But in 1960 the Douglas County assessor in collaboration with the Nevada State Tax Commission was able to use the maps to set up a system of valuations for tax assessments. Water supply and other factors were considered. The result was appraisals based on the productive capacity of the lands, rather than those based on sometimes inflated sales prices.

Ranchers are interested in the soil surveys because they realize their taxes are based upon them. The tax assessment program was the leading reason Douglas County helped pay the cost of the survey. Several other counties in Nevada now are interested in the possibility of adopting the procedure in their tax assessment programs. The first year of the new arrangement, the Douglas County Grand Jury upheld the agricultural land tax assessment by soil conditions and water rights, saying that "This plan appears to be the most fair and equitable plan yet devised for agricultural lands."

Cooperators in the Carson Valley district are planning the development of their ranches based on the soils information derived from the survey. Detailed information about the soils of each place enables the owner or its operator to make intelligent management decisions. These result in the most efficient use of the soil and water resources of each ranch.

SCS Soil Scientist Lou Langan with auger and aerial photo on which he records information

In arid Nevada, water supplies probably limit crop production more than do the soils. Under a large reclamation project, the local water agency—the Carson water district—has encountered the problem of how best it might distribute the irrigation water developed. Again, the survey has been brought into use. Porous soils, those with high infiltration rates, are being singled out to receive extra amounts, because of their inherent poor irrigation efficiencies.

Ranchers wanting to know what their soils look like can see mounted soil samples and soil maps at the Gardnerville SCS work unit office.

The author is work unit conservationist Soil Conservation Service, Gardnerville, Nev.

Conservation Land Patterns Draw Migratory Waterfowl

By Charles Slaton

DUCKS and geese are in for a real treat and so are the hunters in Pennsylvania. Three thousand acres of farmland have been added to the huge Pymatuning marshes in Crawford County by the Pennsylvania Game Commission. All of it is being planned to improve "the view" for migratory waterfowl.

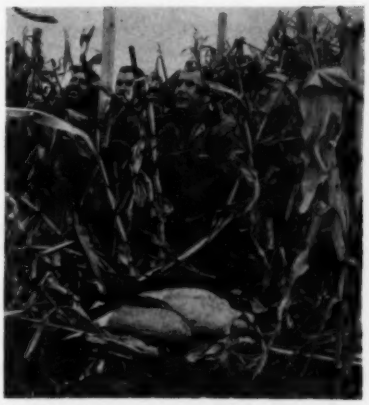
Shortly after the first farms were acquired, the Commission enrolled them in the Crawford County Soil Conservation District program. A conservation plan for 1,500 acres in the project was developed with the help of the Soil Conservation Service. The remaining land is scheduled for planning this year.

Project "Controlled Goose Hunting for Pennsylvanians" started several years ago with the Commission's purchase of several farms adjoining the Pymatuning wildlife refuge. Today, the aerial view of 2 dozen farms is being changed to entice the honkers of the North to pay us a visit. The gimmick is food: corn, clover, wheat, and grass. The long-range use of the newly acquired farmland is for the controlled shooting of geese.

"But our first need," says Ray Sickles, waterfowl management agent for the Game Commission, "will be to attract and hold the geese in the area. We are even hopeful that some increase in nesting will be accomplished.

"Right now, we have enough resting areas for migratory geese, but we came up short with food. With an increased supply of goose pasture and grain, the geese may stick around to thrill many a nimrod. We have started to develop the farmlands as the first step in our controlled goose shooting program."

Conservation pasture and grass crops draw geese to Pymatuning wildlife refuge.



Result—improved hunting in surrounding farm country, and ready cash for enterprising landowners.

The area, as Sickles sees it, also will help improve goose hunting in the surrounding farm country. It will serve as a nucleus to which geese will be attracted from the Atlantic flyway. Many of these geese will explore the nearby country and will provide some fancy shooting and ready cash to the enterprising landowners.

"In developing the plan," SCS Work Unit Conservationist Howard Gates explained, "the better drained soils were set aside for the production of corn and small grain. The grain will be harvested and fed to the webfeet during the winter and early spring months. The wetter soils will be used for goose pasture. Ladino clover and tall fescue are well adapted, and the geese seem to relish the mixture."

The average Canadian goose weighs 6 to 10 pounds, and it takes a lot of feed to support the wiley bird. Thousands of geese use the

The author is assistant to the State conservationist, Soil Conservation Service, Harrisburg, Pa.

Pymatuning area each year, staying from 1 day to 2 months. To meet the grazing needs of their chomping bills, a program of heavy fertilization to keep the pastures green has been scheduled.

"In planning the farmlands, the goose and his needs are never forgotten," Gates emphasized. "To provide the wide-open-space look, more than 22 miles of hedge rows have been removed. Corn is planted in wide rows with legumes planted between the rows. Not only does this open up the area, but it extends the length of feeding time."

Shallow ponds have mushroomed in many of the sags and seepy areas. Some of the pond water supply will come from the managed agricultural land, and the water in the ponds will be regulated to produce acquatic food and serve as nesting sites for the waterfowl.

The controlled goose shooting area is now a welcome landmark on the Atlantic flyway. Thousands of geese find its well-tended look, marked by stripcropped fields, new pastures, ponds, open drains, and waterways, a pleasant resting and feeding area. And it is resulting in improved goose hunting in Pennsylvania!

$30 An Acre Fishing Profits From Once Useless Wetland

By Carl H. Thomas and John Cross

TOO wet for farming—too dry for fish.

That's the way Curtis McCain and George Greathouse, cooperators with the Gulf Coast Soil Conservation District, described 80 acres of marshland they own in Cameron Parish, La.

Soil scientists with the Soil Conservation Service classified the land as Class VIII—too soft for rice cultivation, or even for marsh range, without drainage. That would have been a king-size undertaking; so, instead of removing the water from the area, the owners added water and converted it into a farm pond. As a result, the area now provides recreation for both farm and city people, as well as extra income from formerly idle land for McCain and Greathouse.

The pond was made by building a levee around the area, just high enough to keep enough water on the land for fish. A pump was installed to put fresh water on the 80 acres, and a spillway was constructed to allow excess water to move off in case of heavy rainstorms. The pond was stocked with 80,000 bluegills in October 1960. The next spring, 8,000 bass were added.

Roadside sign brings in fishermen—at $1 a head.

One year later, in May 1962, the pond was opened for fishing. By the end of August, 2,200 people had paid a dollar a day for fishing privileges. Many of them had rented boats for a small fee. A bait stand and refreshment stop, also operated by the owners. Add to the convenience of the fishermen and the income of the owners.

The whole operation is a paying proposition on land that before had not produced enough to pay its share of the taxes. Developed according to its capabilities for recreational use, it grossed almost $30 an acre the first year!

Weed beds made to order by vegetation that came up before pond was finished.

Note:—The authors are biologist, Crowley, and assistant State soil conservationist, Alexandria, both of the Soil Conservation Service, Louisiana.

WATER ON WHEELS

By John K. Hortin

KEN Uchida found that using wheel-move irrigation sprinklers is the best way to get along with the dry summer climate in the Hot Springs area of Utah.

For years, he considered using sprinklers—and even operated a small portable outfit for a time—but it wasn't until 1961, when Soil Conservation Service snow survey reports warned that a drought was on the way, that he decided to go all out with sprinklers. Here are some of the reasons why they are paying off on the approximately 350 acres of irrigated land on his 450-acre farm in the Weber Soil Conservation District with which he is a cooperator:

He is the last of 350 stockholders in the North Ogden Irrigation Company, where streamflow fluctuates from little water to 12 cubic feet per second.

Water losses from sandy soils and open ditches were high, and the sprinklers have proved to be better adapted to short water supply. Also, because of higher irrigation efficiency, less water now is needed.

Savings in manpower for irrigation have been as high as 90 percent.

Nearly all of Uchida's irrigation water is pumped from a reservoir, and little additional operating cost is required.

Larger fields resulting from leveling much of the land are more efficiently operated with modern equipment.

Uchida planned to sprinkle 100 more acres and to tie a beef cattle operation into his farming, to help market his alfalfa hay and increase production.

He says such disadvantages as a temporary disruption of his crop rotation system were soon forgotten in light of his savings in water and manpower.

Three men used to irrigate full time. Now, one man gets off the tractor and changes a quarter-mile line in 10 minutes.

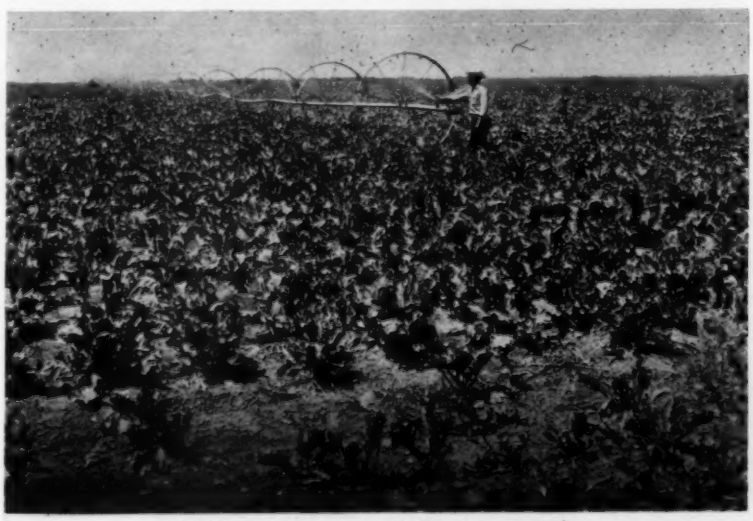
Pump for the sprinkler system.

Uchida's potato farming now is completely mechanical, and his sugar beets also are becoming a mechanized crop. Other crops such as tomatoes and onions, that require a lot of hand labor, play a less important role on the Uchida farm as machines replace the man and his hoe.

Going on the premise that "You can't starve profit out of the soil," Uchida follows scientific recommendations in the application of fertilizer. He uses soil tests and correlates fertility with the needs of the crop to maintain high production.

"Before I make definite plans each year, I look to a number of sources for prospects," he says, "but our biggest concern is the amount of irrigation water available. I cannot afford to take chances with my water supply. I keep in touch with the SCS to get firsthand information on snow conditions."

Besides operating his farm, Uchida finds time to serve as secretary-treasurer of the Weber County Beet Growers Association and as a major in the 501-6th Army, Garrison Army Reserve stationed at Fort Douglas, Utah, and to be an active worker in the Ogden Japanese Christian Church.

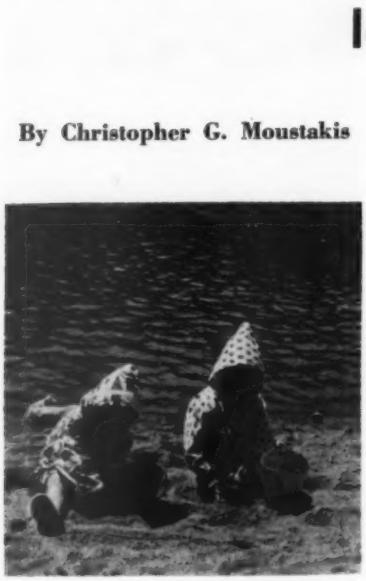


Uchida's wheel-move sprinkler in operation.

The author is soil conservationist, Soil Conservation Service, Ogden, Utah.

Conservation Contractor Converts Idle Land To Recreation Center

By Christopher G. Moustakis



"Air View" is ideal playground for busy bucketeers like these.

MASSACHUSETTS Contractor Joe DeDeo fulfilled a personal ambition and met a community recreational need by building an outstanding water recreation center on a tract of idle land on the edge of his home city of Marlboro.

The area, known as the "Air View" recreation center, has a large manmade pond for swimming, a picnic area with fireplaces, and floodlights for skating. DeDeo put to work all the know-how and experience he gained in building and grading many a wildlife, irrigation, and livestock pond for Middlesex Soil Conservation District cooperators, to shape up to a 20-acre recreation-wildlife area. He got some help from the district and the Soil Conservation Service in laying his plans.

The center of attraction, carved out of 8 to 12 feet of flat muckland underlain with gravel, is a 5-acre, springfed dugout pond. As DeDeo said, "there's enough water pressure there to keep that water changing, and tests show that it's good enough to drink."

"My ambition has been to buy a piece of idle land like this and make a recreation area out of it," he explained. "It will be a place of retirement for me some day; and at the same time I can provide some fun for people—you know how tight water recreation areas are getting around here!

"The city officials welcomed me when I asked for permits to go ahead. They thought the recreation project was a fine idea and good for the city of Marlboro."

DeDeo bought the land in 1959. He got soils information and engineering advice from the Middlesex district. He cleared the pond area right away and, in between doing conservation work for the district, used his dragline and bulldozer to dig his own pond. Two years and 35,000 cubic yards later, the pond was finished. Much stump burial, dirt removal, grading, sloping, and sanding readied the place for business.

The finished job offers a 1,200-foot beach around the edge of a peninsula and half a mile around the outside edge of the pond to swimmers in the summer, and 5 acres of ice surface to skaters in the winter. There's a trout fishing area too. Around the pond, picnickers can relax under pine-oak and use fireplaces to roast their hot dogs. DeDeo opened the area to skaters in January and to swimmers in June of 1961.

"The best days bring 850 people here," he reported. "Maybe 10,000 used my place last summer, but of course many come back again and again. I get repeat visitors from 40 to 50 miles away."

He intends to expand on the variety of recreation available by building a tennis court and a ball field for the summer visitors, and

An air view of "Air View."

The author is State Soil Conservationist, Soil Conservation Service, Amherst, Mass.

an outdoor hockey facility for the winter. He also will make use of the wildlife resources.

"I found that people get a great deal of satisfaction out of just watching the rabbits and the pheasant in the area," DeDeo said. "Pretty often, I'm lucky enough to get ducks and Canadian geese stopping over at the pond. I intend to plant parts of the area to trees and shrubs that will attract and keep wildlife here."

"The project took the better part of a year's use of equipment at a considerable cost, particularly with building facilities," DeDeo said, "but I had some byproducts, too. I had a good 15,000 cubic yards of muck, surplus to my need, and about 10,000 cubic yards of fill. I also had some red maple wood which I split and used in the skaters' clubhouse fireplace and for the picnic area fireplaces. I used all of this byproduct to offset some of the cost. I sold some muck and fill and bought fine sand for the beaches."

DeDeo feels that converting idle land to a multipurpose facility for recreation is good conservation, especially where the urban spread is being felt strongly in rural areas. He believes that there are any number of landowners who could capitalize on the recreational potential of nonagricultural parts of their holdings to supplement the farm income and meet outdoor recreational needs apparent in any rapidly developing urban area.

And on the beach.

Conservation Nature Centers—

Laboratories for Land Learning

By Herbert I. Jones

THIS summer millions of Americans who care little about hunting and fishing or whose limited time precludes extended trips are discovering conservation and enjoying the out-of-doors through visits to community nature centers.

These areas of undeveloped land near cities and towns have facilities and services designed to conduct programs in natural science, nature study and appreciation, and in resource conservation.

The conservation nature center is a fairly new concept in community education and recreation and differs from such older, well-known city facilities as a park, zoo, museum, playground, or picnic-camping site. It is, ideally, a sample of the natural landscape of the community—of forest, tideland, or prairie—a part of native America set aside and interpreted for the enjoyment and edification of people.

A nature center is designed to orient the community to ecological realities and in this way help citizens plan their use of land scientifically and responsibly. There are perhaps a hundred such centers across the Nation. All represent naturalness rather than manmade facilities. Among the older, more prominent centers are Aullwood Center near Dayton, Ohio; the Children's Museum at Charlotte, N.C.; Bear Mountain, N.Y.; Big Cypress in Florida; and the Arizona-Sonora Desert Museum at Tuscon.

Last year 70,000 people visited the growing interpretive center and yet incomplete exhibits at Ghost Ranch northwest of Santa Fe, N. Mex. School groups, Scout troops, church classes, farm and ranch families, and scientific societies were among those counted. School officials transported whole

The author is field information specialist, Soil Conservation Service, Denver, Colo.

Telescope views at Ghost Ranch fascinate young and old. Here the scene is a geologic wall.

classes of Albuquerque youngsters more than 125 miles to the center to help them develop concepts of conservation and to learn lessons only contact with the land can teach.

This summer, groups of young churchmen visiting nearby Presbyterian Conference headquarters are lending a helping hand at Ghost Ranch with weeding, seeding, and trail work. Monoliths and other soils exhibits are being placed by Soil Conservation Service and New Mexico State University scientists. These exhibits follow field erosion-conservation demonstrations; and eventually the SCS's total program will be represented in display.

Before long, a 6′ x 12′ scale model and mounted telescopes will illustrate principles of and direct visitors to the Santa Cruz watershed protection and flood prevention project. The U. S. Forest Service has installed a 2-acre mini-

Exhibits of range sites and condition are featured at New Mexico center.

ature forest exhibit. Animals of the area are displayed to attract attention. Development of this center is under the direction of the naturalists, William H. Carr, and the Charles Lathrop Pack Foundation.

The Plains Conservation Center near Denver, Colo., is an even newer center. It is the first one in the Nation to be sponsored by a soil conservation district.

Supervisors of the suburban West Arapahoe Soil Conservation District bought 2,000 acres of rolling prairie 14 years ago and set up conservation demonstrations. Later on, university biology students did research, and youngsters planted trees, studied soils and grasses, and hiked the pioneer trails. Eventually, as the city expanded, the district leaders recognized theirs was a greater opportunity for resource-nature training. By this time, the metropolitan area had nearly 200,000 school age children. Many had had little opportunity to learn about the Plains, although they are at the city's doorstep.

The result has been the organization of the Plains Center Association. Its board of trustees includes many nationally recognized business, educational, and civic leaders, as well as professional conservationists. The West Arapahoe district board now employs an educational supervisor. Before the year ends, plans for building an interpretive center and permanent exhibit will be completed.

The growing national interest in outdoor recreation-education was reflected in the creation of a Nature Centers Division of the National Audubon Society 2 years ago. Nature Conservancy and many other groups also are prominent in this field. Last spring more than 100 people from across the Nation gathered at Asilomar, Calif., for what may have been the first workshop ever held on the creation of centers. Out-of-door teaching is high on the agenda of the Soil Conservation Society of America's na-

tional meeting to be held in Logan, Utah, August 25-28.

Thus the need and usefulness of nature centers in more heavily populated sections where national and State outdoor areas have become overtaxed is receiving more attention at the community level, where soil conservation districts and other conservation interests can play a leading part in creating such centers.

Some of the members in front of clubhouse built to serve also as fallout shelter if needed.

BORROW PIT MAKES GOOD ARCHERY RANGE

By R. L. Hall

WHAT to do with a seemingly useless 14-acre hole in the ground was Victor Esham's problem after the last truck load of highway earthfill left the borrow pit on his farm 2½ miles from Berlin, Maryland.

Berlin was dumping in an abandoned borrow pit closer to town and did not need an additional pit. Regrading and trying to farm the land was not the answer, because the soil is droughty and never did produce well. Letting the pit revert to timber likewise would not have worked, because the exposed sterile soil would support only poor tree growth.

Esham's answer came in 1953 with the formation of the Queponco Bowmen's Club, which chose this archery range site because of the rough terrain and the short distance from town. Today, after a decade of increasing use by vacationing archers from as far away as Washington, D. C., Philadelphia, Pa., and Baltimore, Soil Conservation Service technicians cite it as an example of good land use suited to the particular conditions.

The abandoned borrow pit, from 5 to 10 feet deep, is a rugged piece of ground, piled high with mounds of earth and stumps. Uncommon to the area, the pit did not fill with water. Difficulty in finding lost arrows, because of this terrain, gave the site the name, "Lost Arrow Range." Room to set up 28 targets required 6 more acres, on a steep bank between the pit and a stream.

The Lost Arrow Range has roads, trails, and a clubhouse built into a bank and covered with sand bags. Members did all the construction, with a cash investment of around $1,000 for materials. Yearly dues of $10 help pay maintenance costs.

The Club holds a 2-day meet once a year, which draws archers from 150 to 200 miles away. The range is both interesting and challenging, in that it presents a variety of situations. Top score on the Lost Arrow Range to date is 421 out of a possible 560. The range is about 5 miles from Maryland's seacoast resort of Ocean City.

Esham's only payment for the use of his land by the Club is a free membership—and the satisfaction he receives from knowing he is furnishing opportunities for recreation being sought by growing numbers of people.

Queponco Bowmen Club archers take aim at one of 28 targets from foot of a spoil bank.

The author is soil scientist, Soil Conservation Service, Snow Hill, Md.

Conservation—A Profitable Way of Life

By William Ross

TO Idaho farmer Carl Christensen conservation is a profitable way of life.

Conservation did not just come to Christensen—he and Mrs. Christensen and their children have had to work for it. When he bought the farm in the Sterling area in 1953, he asked a friend where he might get some help with his ideas on conservation. This friend told him that the best way to get the kind of technical help he needed would be to help form a soil conservation district. This he did.

Christensen circulated petitions and worked hard in the organization of the South Bingham Soil Conservation District, which was organized in 1955, was one of its first cooperators, and now is an alternate supervisor. He called on the district board for technical help from Soil Conservation Service technicians in working out his own problems, and before long had developed a complete plan of soil and water conservation. Now, 7 years later, all of his fields have been leveled, and the complete plan applied.

In expressing his views on conservation, Christensen said: "To me, conservation is a way of life. Conservation means to produce more from the soil with less work, water, commercial fertilizer, and money, and to save the soil for future generations—or to have the land in better condition for the future than when I acquired it."

The way conservation can increase the loan value of a farm is an important item, Christensen believes. He said that between 1953 and 1958, one agency increased the loan value of his farm by more than $7,000.

His sugar-beet yields have increased about 6 tons an acre, and his hay yields have increased about 2 tons to the acre.

Since leveling his land according to the plan, he says he can irrigate in his Sunday shoes, and with a substantial saving in labor.

Christensen estimated this field of wheat would yield 90 bushels an acre.

"I don't have to walk down those rows to see where the water is," he explained. "I know when it is going to get to the other end. One of my fields used to take about 2 weeks to irrigate. Now, I can irrigate it in 4 to 5 days, depending on the amount of water I have.

"When I came on the place, the Agricultural Conservation Program had the fields numbered for identification. I had 26 different fields, and now I have 9. If I hadn't leveled my land, I would never have been able to make the place pay. You bet leveling pays!"

Christensen also considers drainage to be one of the most important

Christensen (r.) and Bill Ross of SCS discuss importance of improved pasture in overall conservation program.

Note.—The author is work unit conservationist, Soil Conservation Service, Aberdeen, Idaho.

Harvesting sugar beets on land leveled the fall before.

parts of his plan. He is now able to drain every field, with no water left on the land to drown out crops.

Along with being a good conservationist, Christensen is a good family man. His wife feels the same way he does about conservation. She has gladly done without many things in order that the money be spent to improve the farm. One or more of his children usually works with him. He has six girls and two boys. His oldest son helps with the tractor work, but the girls do their share, too!

This Idaho farmer doubts that conservation farming is possible without livestock. He usually keeps about 15 head of beef stock, 20 milk cows, and 100 sheep. His oldest son and daughter share the milking chore.

In 9 years, the farm has more than doubled in value. Meanwhile, Christensen has bought another 160 acres and promptly set about arranging for a conservation plan which he is applying on it, also.

Irrigation Improvement Assures Good Hay Yields

By J. E. Preston

DICK HUMBERT turned 50 acres of poor land of uncertain yield near Walden in north-central Colorado into a high-producing hayland with a relatively low investment by solving an unusually tough erosion problem and making more efficient use of irrigation water.

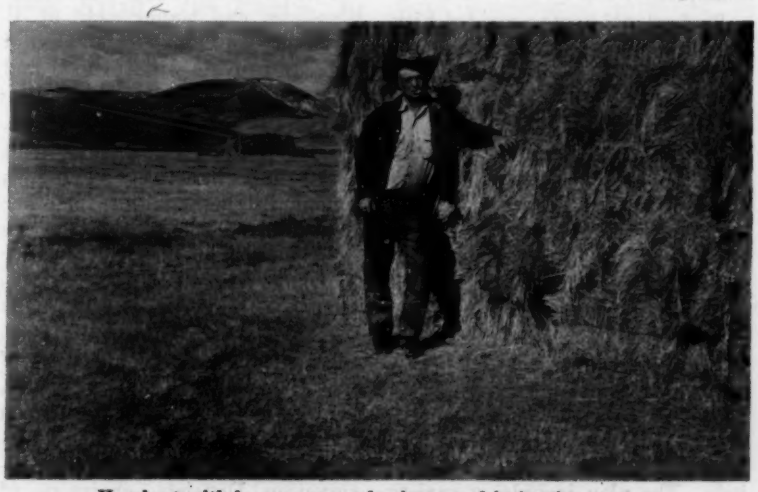
A too rapid flow of water had cut a miniature Grand Canyon into Humbert's land. He had tried many ways to slow up the speed of the water in the last 2,500 feet of the big Wolfer ditch, but nothing seemed to do the job. The result was caved-in ditch sides, with clogged supply and spreader ditches beyond. The silt spread over areas of Humbert's meadow, and trying to keep hay production up under such conditions was out of the question.

"It was a real mess," Humbert recalls. "Every year I would spend days working on that ditch with my tractor. Finally I realized the problem couldn't be solved. It had to be erased."

Humbert already was making good progress with his complete soil and water conservation plan through the North Park Soil Conservation District, and in the spring of 1960 determined to deal next with his chief erosion problem. Soil Conservation Service technicians designed a concrete inlet structure and spillway for a 30-inch pipe to take the water safely to the lower section of the ditch where it could flow into Humbert's contour ditch irrigation system without damage. Construction began in the fall of 1960.

Use in the following spring proved the new structure to be successful. Humbert's alfalfa-brome meadow may have been the only hayland in the district yielding two cuttings that year. They averaged nearly 2 tons to the acre. In the 1962 season the cuttings were nearly as good. In North Park, the production average is about 1 ton an acre a year on native hayland.

Ahead of Humbert in carrying out his soil conservation plan is



Humbert with hay grown under improved irrigation system.

The author is soil conservationist, Soil Conservation Service, Walden, Colo.

The big gully that caused Humbert so much trouble.

the leveling of 50 acres for more effective use of water, and surveying of irrigation ditches and structure sites. He knows this improvement will be profitable, because on a 2-acre tract he leveled and seeded to a grass-and-clover mixture he got 5 tons of hay in one cutting. Humbert also is keeping an eye on a 6-acre trial planting of meadow foxtail and Alsike clover, which is a part of the acreage he is able to use efficiently now with the new pipeline and stilling basin.

Humbert, with his improved water delivery system, will irrigate 800 acres now.

"Before, I was irrigating 650 acres and doing a poor job of it," he said. "I will not only be able to use my land better, but I can make the water I have go a lot further. In this country, that's important to an irrigation rancher."

From Boxing To Ranching—

A Winner in Both

As a young man Walt Fick was a boxer. He won in the Midwest Golden Gloves tourney in Omaha and boxed in Chicago. In the national matches in Boston, he was eliminated by the international champion.

Professional bouts provided Fick with money to buy his first heifer calf. Later he bought more calves, and finally, in 1939, he bought his first grazing land.

Thanks to the help of his wife and five children, rancher Fick today owns and operates a 2,760-acre ranch in Holt County, Nebr. The ranch is pastureland with wet-meadows for hay. It is an excellent example of conservation ranching in that area.

Fick, who operates a 115-cow herd of commercial grade Herefords, follows a conservation district plan worked out with Soil Conservation Service technical help. The plan includes a variety of measures for protecting his land and maintaining efficient production. These include deferred grazing and other proper range-use practices, range and meadow seeding, a well for stockwater, farmstead and livestock tree windbreak plantings, and management of 31 acres of lake, marsh, and sand areas to provide wildlife food and cover.

It takes time to become a successful rancher; but, because Walt Fick believes in actively serving his community, he finds time for other things. These have included service as chairman of the Holt County Soil and Water Conservation District board of supervisors, member of the local school board, president of the Nebraska Section of the Range Society of America, chairman of the committee on range judging from the State Association of Soil and Water Conservation Districts, chairman of the Holt County school re-districting committee, and member of the Holt County Extension Board.

He says he is glad that his operations are on a family-size unit so that he can give time to local organizations that he recognizes are a part of a true democratic society.

In 1961, Fick, as a 4-H Club leader, trained his club members and took them to Oklahoma City. There, the club placed first in the International Range Judging Contest. Fick entered the adult contest and won high individual honors. Later that year, he took first place in the professional division of the Nebraska range judging meet.

He believes ranching is the best expression of individualism today, and that here a man can reach as far as he cares to extend himself. He also believes that the home is the place to teach young people

proper values, and that the American way of life will be carried on in direct relation to this teaching.

Looking back on his early experience in boxing, Walt Fick admits that such skill may have no place these days in ranching. Still, he says, the competitive spirit that is

Walt Fick.

so valued in the ring stands a man in good stead when he is defending principles important in life. And, of course, those first earnings in his ring career got him started in the life he loves. There is satisfaction in that.

—C. Dale Jaedicke

DISEASES OF TURFGRASSES. By Houston B. Couch. 289 pp. Illus. 1962. Reinhold Publishing Corp., New York. $10.00.

This book presents detailed information relative to the identification, nature, and control of many diseases affecting turfgrasses, including illustrations essential for identification. In all, 48 diseases caused by physiogenic factors, viruses, bacteria, and parasitic or predatory animals are discussed. Included for each is information on symptoms, host plants, and the disease cycle.

Description of the symptoms includes those that occur when the grass is used in lawns and, in some cases, when the plant is in the seed stage. In addition, there is a comprehensive list of forage grass species, by common names, that are susceptible to turfgrass diseases, and also a list by technical names. More than 400 species are listed in the tables and convenient references to the susceptible diseases.

The author has included nearly 200 references of technical publications on the subject, which should be helpful for the turfgrass specialist and soil and water conservationists increasingly concerned with recreational area land-use developments.

This book should be a good reference for pathologists, agronomists, and turfgrass management specialists dealing with golf courses, park maintenance, and defense agency lands. It also has some value for those interested in conservation in general, as many species of grasses used for erosion control are host plants for various turf diseases.

—B. D. Blakely

THE STORY OF DAMS. By Peter Farb. 127 pp. 1961. Harvey House, Inc., Irvington-on-Hudson. New York. $2.95.

This is a well-written book with excellent illustrations, diagrams, and line drawings, as well as four pages of full-color sketches showing eight world-famous big dams. "The Story of Dams" has a place on the science shelf in the upper grades or junior high library of any school. Several appropriate experiments and field projects have been incorporated that teachers can use in their soil and water conservation units, or that can be carried out by the young scientist without supervision.

Chapter 1 covers the water cycle, importance of water in modern society, and future water requirements of industry and agriculture. In chapter 2, the author pays tribute to modern soil conservation and the Soil Conservation Service. He describes the beneficial effects of conservation practices in reducing sediment production, thus prolonging the useful life of downstream dams and reducing the amount of flood-producing runoff water.

Succeeding chapters picture outstanding examples of each type of big dam and describe it in considerable detail. The reader thus learns of gravity, arch, and buttress types of concrete dams and compacted earthfill dams, how to recognize these structures, conditions under which each is used, and problems in designing and building them.

The author describes each of the many needs which large dams fulfill. They control floodwaters, provide hydroelectric power, store water for irrigation and city water supplies, and provide man-made lakes for recreation. He also discusses systems for control of entire river basins, including the Columbia River Basin and the Tennessee Valley.

Although the author has capably described effects of individual farm conservation programs on water quality, quantity, and sediment production and the place "big" dams play in water management of large river systems, it must be pointed out that he failed to mention the function of small dams in "small-watershed" programs on community-size, upstream watersheds or the watershed program of the Department of Agriculture.

—Allen L. Fisk

IRRIGATION AND CLIMATE. By Henry Olivier. 1961. Edward Arnold Limited. London. $25.00.

Olivier proposes a procedure for estimating irrigation water re-

GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS
WASHINGTON 25, D. C.

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID
PAYMENT OF POSTAGE, $300
(GPO)

If your address changes, please notify us of your complete new address, including zone or RFD number, and include old address with our code number as shown above.

quirements of crops, and recommends it as a universal method for engineers to make rapid estimates of "basic field water requirement" for new irrigation projects. This is defined as "the quantity of water regardless of source, required by a hypothetical crop in a full stage of growth in a soil which is being held at a moisture content well above the permanent wilting point."

The procedure was formulated to utilize climatic data available in countries where meterological stations are of the "second order" (sic) class. The subject is presented primarily from an engineering point of view, i.e., as a guide to determining irrigation storage requirements and the capacity of distribution systems from available ordinary climatological data.

Olivier's formula has two terms: (1) Average depression of wet-bulb temperature in °C., and (2) a numerical factor based on "clear sky" values of solar radiation for various latitudes and months. The formula is very similar to the transpiration equation proposed by Briggs and Shantz in 1916, using the vertical component of solar radiation and the vapor saturation deficit.

Olivier wisely cautions engineers to be exceedingly careful in using water consumption data obtained from small container studies, because they may not have been adequately surrounded by a similar crop and therefore would receive excess radiation. He also recognizes that transpiration by crops grown in containers may be greater than by those in a field and that evaporation from pans and instruments is affected by their "exposure." The author supports his proposal to a large extent on results obtained in the classic work of Briggs and Shantz from 1912 to 1915 and on evaporation pan studies.

However, Briggs and Shantz also worked with containers 16 inches in diameter and 26 inches high, and each container was completely isolated and above ground. They measured daily transpiration rates as great as twice the direct radiation from the sun, even after correcting for the exposed area of foliage intercepting direct sunlight. They concluded that "Even on bright days, therefore, other sources of energy, such as the indirect radiation from the sky and the surrounding objects and heat energy received directly from the air, contribute materially to energy dissipated through transpiration." Thus, these studies are not typical of the environment of field crops.

Extensive literature review is presented. However, more recent and extensive U.S.A. literature on the subject was not covered.

Engineers, especially those working in countries where water-requirement data are meager, will find this book useful for rapid estimates of water requirements for projects having a variety of crops. For peak use rates for a period of a month on a single crop, with a complete green cover and for maintenance of adequate soil moisture, the forecasts obtained may be low for design purposes. The book is a good source of water delivery data for numerous scattered locations.

—MARVIN E. JENSEN

SCSA Meeting

The Soil Conservation Society of America holds its 18th annual meeting at Logan, Utah, August 25-28. The theme this year is "Land, Water, and People." Speakers include Gov. George D. Clyde of Utah; President Daryl Chase of Utah State University; Administrator D. A. Williams and Deputy Administrator Charles E. Kellogg of the Soil Conservation Service; and Society President George N. Browning. They and other speakers and symposia participants will discuss topics ranging from recreation to the human aspects of conservation planning and rural community development, and from urban conservation problems to conservation economics water and soil resource management.

US.8 558 S

TS

SOIL CONSERVATION

Index

VOLUME XXVIII

August 1962 to July 1963

PUBLIC LIBRARY
MAR 10 1964
DETROIT

UNITED STATES DEPARTMENT OF AGRICULTURE

Issued February 1964

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402 - Price 15 cents (single copy). Subscription Price: $1.50 per year; 75 cents additional for foreign mailing. Index issues vary in price. This issue 10 cents.

UNITED STATES DEPARTMENT OF AGRICULTURE
[SOIL CONSERVATION SERVICE

SOIL CONSERVATION—INDEX TO VOLUME XXVIII

AUGUST 1962 TO JULY 1963

Agency for International Development sends specialists to other countries ... Page 7-8
Agriculture and Business ... 94
Agriculture, U.S. Dept. of, is interested in recreation development on farms ... 192
Alabama, profitable recreation ... 185–186
Alaska, Last Conservation Frontier. William B. Oliver ... 164–166
Algeria, much progress in soil conservation ... 4
ALLEN, WALTER S.—
Kids' Ranch Camp Outpays Farming ... 186–187
Ministers Spread Stewardship Message as Conservation District Chaplains ... 228–230
America the Beautiful. A picture story ... 252–253
ANKER, LEONARD A.: Soil Surveys Basis for Land Assessments ... 276
ARCHER, SELLERS G.—
Yugoslavians Take Home Their Conservation Findings ... 9
Watershed Reservoirs Draw Paying Customers ... 188–189
Arizona—
cattle rancher developed a conservation plan ... 89
Sonora Desert Museum, a conservation nature center ... 281
water outlook good ... 212
Arkansas—
bankers conservation tour ... 243
William Wilson Campbell, District Profile ... 115–116
Farmer's Conservation Money-makers. Max D. Bolar ... 107
Six-Mile Creek watershed attracts paying customers ... 188
Army Corps, U.S., approved South Fork and Patterson Creek watershed programs (W. Va.) ... 67
ARS provides special research for Defense lands ... 271
ASCS—
agreed to pay half the cost of drainage improvement (Mont.) ... 150
approved cost-sharing for dugouts (Nebr.) ... 275
authorized to cost-share certain recreational measures ... 197
cost-shared costlier jobs (Nev.) ... 41
cost-shared dams, Frog Hollow (Kans.) ... 161
cost-sharing provisions ... 109
follows concept of temporary ownership ... 234
had fields numbered (Idaho) ... 284
heads cropland conversion program ... 197
indication of Nation's conservation efforts ... 27
operation of ... 148
provides cost-sharing (Hawaii) ... 156
Asia's Golden Rain Tree Goes to College. Melvin M. Thompson ... Page 21
ATKINSON, WILLIAM H.: Nonfarmers Size Up Soil and Water Conservation ... 89–90
Australia, treated for soil and water conservation ... 4

BAKER, JOHN A.: USDA Moves Ahead on Recreation ... 192
BARNETT, HOWARD T.: District Profile, William Wilson Campbell of Arkansas ... 115–116
Beasley, Bill, rotates bahiagrass pasture with cultivated crops (Fla.) ... 163
BELLARD, CHESTER F.: Riceland Smoothing—Under Water ... 158–159
BENNETT, JACKSON: From the Ends of the Earth—They Learn About Conservation and Americans ... 16–17
BENNETT, JAMES S.:
New Hope for Urban Area Wildlife ... 189–190
School Conservation Project Heals Freeway ... 53–54
BERG, NORMAN: Review of Land Economics Research ... 120
Billups, D. E., designated land, recreation ... 260
BLACKHAM, L. BARD: Land Now Worth Hundreds of Dollars an Acre ... 102–103
BLAKELY, B. D.: Review of Diseases of Turfgrasses ... 287
Bober, Sam, Louis, and Jack, devote acreage to develop new seed varieties (S. Dak.) ... 232
Bochert, Oscar, posted field Nos. on farm ... 79
BOGGS, CARL D.: Conservation Helps Churches and Schools ... 223–224
BOLAR, MAX D.: Arkansas Farmer's Conservation Money-makers ... 107
Bolivia sent technicians to training center ... 16
Borrow Pit Makes Good Archery Range. R. L. Hall ... 283
Bozeman, J. A., WUC and Methodist minister ... 237
BRADSHAW, JOHN: Mormons Soil-Water Stewards for More Than a Century. With Norma Yourchik ... 239–240
BRAITHWAITE, DON L.: Utah Irrigators Lick Water Losses ... 203
Brazil—
sent 5 to training center (Ga.) ... 16
teams in carrying out training gave assistance to their farmers ... 7
Briggs, Ezra, of California, District Profile. Fred W. Herbert ... 44
BRISCOE, SHERMAN: This Family Farm Is Based on Conservation ... 235–237

Page

BROWN, H. RAY: Bankers Score in Kansas Grassland Management 80–81
BROWN, ROBERT L.: Hawaii's Land Operators Back Conservation With Dollars 156–157
BUIE, T. S.: Good Soil Stewardship Key To Land and Water Resource Use 233–235
Burma—
developed soil conservation program 18
visited by Secretary and staff 10
By Accident and By Design. William W. Nace 259–260

Caggino family made browntopmillet field-trail plantings (S.C.) 176
California—
Ezra Briggs, District Profile 44
counties published Inventory of Soil and Water Conservation Needs reports 166–168
drop structures at base of watershed 200–201
farm becomes profitable livestock-orchard unit 114
irrigation water management in Redlands-Highland SCD 214
swimmer conservation's strongest booster 128
water knowledge enabled owner to put in additional pasture and hay land 111
Calloway, N. K., contract-planted trees for others (Ark.) 107
Cambodia sent technicians to training center 16
CAMPBELL, FLOYD W.: New Aerial "Portrait" Helps Map Maine County 248–249
Campbell, William Wilson, of Arkansas, District Profile. Howard T. Barnett 115–116
Canada—
conservation authority greater than U.S. or New Zealand 20
first formal soil conservation programs, 1936 4
CARLSON, LELAND H.: Watershed Project Saves Cedar City Dollars 88–89
CARYL, NORRIS R.: West Virginia Road Commission Sets Conservation Pattern 66–67
Cattle—
beef, farm prosperous (W. Va.). Cover picture ..... [26]
Beef, Primrose Path for. Thomas N. Shiflet 119
Campsite Outpays. Robert E. Myers 112
Central America treated for soil and water conservation 4
Chambers, Florence, first a swimming champion, now a conservationist (Calif.) 127–128
CHAPMAN, C. W.: Watershed Dams Provide Better County Roadways 268–269
China, vast plan for river management 4
Christensen, Carl, says conservation is a way of life (Idaho) 284
Churches. See Soil Stewardship.
CLAY, J. E.: Conservation Plantings Protect-Beautify Roadsides 245
Colombia, greater yields incentive for soil conservation .....
Colorado—
Air Force Academy roadside cut fill scars treated 62

Colorado—Continued
Page
Captain Rolland L. Graves, District Profile 258
farmer applies conservation practices 90
farmer feels obligation to the future generation 221
gullies corrected by inlet structure and spillway 285
Plains Conservation Center, a nature center 282
Rancher Profits by Combining Business Methods and Soil Stewardship. Robert K. Griffin 221–222
RR travelers view Ramah Dam 255
snow survey cooperator 111
snow survey training school 130
water situation improved 212
women in conservation. Cover picture ..... [122]
COLVIN, JOE: Watershed Lakes Bring Benefits to Louisiana's Bayou Area. With John Cross 180–181
Connecticut—
plants from seed grown along highway system 54
Waterfowl Marsh Development Catch On in. Edwin A. Swenson, Jr 209–210
Conservation—
A Profitable Way of Life. William Ross 284–285
and Americans They Learned About. Jackson Bennett 16–17
and the Ministry 237
Clubwomen's, Motto: "Do More Than Just Sit Back." Mrs. M. Lewis Hall 132–133
Commission, Town, New Resource Tool. Lillian P. Sartain 183–184
Contractor Converts Idle Land to Recreation Center. Christopher G. Moustakis 280–281
Discovery, Birdsfoot Trefoil. Homer E. Stennett, Paul G. Mattern, Jr., and Guy Fuller 151–152
Drains Spell End to "Town's" Digging Bees. Edward G. Konieczny 92–93
drives carried on by Spain 12
education sponsored by Minn. Daughters of the soil 138–139
Farm Equipment Industry Invests in Soil. W. J. Klein 84–86
Farmer, From Swimming Champion to. Robert F. Tegner 127–128
Farming, Bigger Profits Spur to. Carroll H. Dwyer 99–100
farming on two rundown farms (Ohio) 33–34
Farming Rewarding, Farm Wife Finds. Mrs. Roswell A. Jacobsen 238
financial gain is principal benefit to individuals and community 108
Findings, Yugoslavians Take Home Their. Sellers G. Archer 9
For Better Roads Moves Ahead. Donald A. Williams 60–62
From the Air, Student Geographers-Farmers Study. Benjamin F. Richason, Jr 250–251
Ground-water Control Rescues County Road. Robert J. Packer 150–151

Conservation—Continued Page

Helps Churches and Schools. Carl D. Boggs 223–224
In "Partnership With God," He Practices. Stephen L. Turner 226–227
Is International. Donald A. Williams 3
Jury, Ladies Are. W. L. Heard 142–143
Keys Key to Worldwide Peace. R. W. Sanders 6–7
kit for women's clubs well received (La.) 136
Land Patterns Draw Migratory Waterfowl. Charles Slaton 277–278
Management by Mail, Field Number Signs Solve Problem of. Stanley Yusk 79
measures (W. Va.). Cover picture [266]
more recently undertaken in Alaska 164
Nature Areas, Audubon Classes Travel to. Georgie A. Keller 263–264
Nature Centers—Laboratories for Land Learning. Herbert I. Jones 281–283
Needs Inventory Guide to County Planning. Fred W. Herbert 166–168
of soil and water good business (Hawaii) 156–157
of water resources worked on by League of Women Voters 139–140
on Defense Lands. Ella P. Wilkin 271–272
patterns. Cover picture [242]
pays in Ohio. Cover picture [98]
Pays Off for Oregon Rancher. Everett C. Green 161–162
plan includes water-spreading system, dams, and wells (S. Dak.) 270
Planning for, Pays Too! Billy S. Peavy 114–115
Plantings Protect-Beautify Roadsides. J. E. Clay 245
Program Makes Idaho Ranch Pay. Clarence Hedrick 267–268
progress (Pa.). Cover picture [146]
Progress, Signs of. V. P. McConnell 153
Progress Stirs Memories. Charles Slaton 154–155
Progress, the True Measure of. Donald A. Williams 147–149
Puerto Rico's Mrs. Torres Preaches—Practices Conservation. J. F. Marrero 134–135
Queens of. Erland A. Loving 143
Safeguards Historic Pepper Fields. Leon J. Sisk 272–273
School Project Heals Freeway. James S. Bennett 53–54
scouting award, Hornaday, won by Michael Wilson (Ohio) 46
Soil and Water, Nonfarmers Size Up. William H. Atkinson 89–90
soil program developed in Taiwan and Burma 17
Success Story, Japanese. Eldon Wrenn 40–41
Tailor Made—Clothing and. Gordon J. Price 91
The Businessman and. Walter B. Garver 75–77
This Family Farm Is Based on. Sherman Briscoe 235–237
3 Ways To, Canada, New Zealand, United States. William Van Dersal 19–20

Conservation—Continued Page

Tomorrow's Women in 144
tour of farms by Oregon elementary school children 81
tour of Louisiana bankers 243–245
Training for in Many Lands. J. B. Rogers and Lee B. Shields 7–8
Way, "Sod-busting." J. H. Senterfitt and H. E. Van Arsdall 163
wife interest in watershed work great help 137
wives conservationists in own right 126
woman helped to organize Conservation Forum of New York State 129
work (New Zealand). Cover picture [2]
"Cows, Twice As Many, Twice As Easy." Clarence Kelley 28–29
"Crawdads" Are Crayfish and Vice Versa. Carl H. Thomas 31
Cross, J. W., first farmer in district to work out a conservation plan (Tenn.) 101
CROSS, JOHN—
$30 an Acre Fishing Profits From Once Useless Wetlands. With Carl H. Thomas 278
Watershed Lakes Bring Benefits To Louisiana's Bayou Area. With Joe Colvin 180–181
Cuba—
sent technicians to training center (Ga.) 16

DALE, TOM: Review of "A History of Land Use in Arid Regions" 23
Dam(s)—
diversion, built by Canal Co. (Utah) 203
floodwater, Kentucky. Cover picture [196]
DAVIS, DAVID O.: Texas Watershed Project Yields Fun-Landowner's Income 174–175
DAVIS, ROY M.: County Builds Road To Serve Watershed Project 71
DAVISON, DONALD N.: Grass-Water Conservation Brings Results 105–106
DAVISON, VERNE E.: Doves and Peaches Double Land Use 176
Defense, U.S. Department—
provides services and facilities useful to USDA agencies 271
DeGregori, David, livestock-orchard unit profitable (Calif.) 114
DELLBERG, ROBERT: Ranch Watershed Job Pays Good Dividends 200–201
Dennis, Walter, says GPCP drought-proofed ranch (S. Dak.) 270
DERR, LOUIS E.: Soil Surveys Help Engineers Build Better Roads 262–263
Dickson, Lois's "Brae Rabbit Farm" (Ohio) 178–179
DISEKER, E. G.: Native Plants Promise Roadbank Protection. With E. C. Richardson 68–69
District of Columbia—
highway bank conservation. Cover picture [50]
Metropolitan Small-Watershed Project 93
Dobrivojevic, Srboljub, trainee from Yugoslavia 9
Drainage—
communitywide work for growers (Mass.) 92
improvement plan (Mont.) 150

Drainage—Continued Page
measures installed with SCD help 223
DWYER, CARROLL H.: Bigger Profits Spur To Conservation Farming 99–100

East Africa first formal soil conservation program 4
EBERT, EMIL E.: The "Second Frontier" Today 33–34
Economic(s)—
benefits accruing from snow surveys 110
benefits from conservation changeover 101
benefits from recreational venture (N.Y.) 112
Erosion Control Structures Replace County Bridges. Eugene E. Solomon 118
Factors Essential in Sound Conservation Program. Donald A. Williams 108–109
farm operation physically feasible and based on 101–102
fundamental in American Tree Farm System 104–105
grass might do better than grain (Mont.) 113
important in woodland (Ark.) 107
increase result of grass (Utah) 102–103
increased farm-ranch operation 105–106
saving in concrete canal lining (Utah) 117
success of livestock-orchard unit (Calif.) 114
Ecuador sent technicians to training center 16
Education—
and Skills Key To World Resources. Gladwin Young 10–11
conservation farm for city folks (Ohio) 178–179
conservation nature center new concept in 281
courses and trips by Audubon Society 263–264
ELIZALDE, R. M.: Spain's Conservation Program Makes Rapid Strides 12–13
EMERSON, ARTHUR W.: City Kids Have Big Weekend on Oregon Conservation Farm. With Louis Gilliam 81–82
Equipment, wheel-move irrigation sprinklers best adapted to short water supply 279
Erosion, Federal and State Road Agencies Battle. Robert T. Walker 51–53
Esham, Victor, made archery range out of borrow pit (Md.) 283
Extension Service—
concerned with water conservation 140
leading out with education programs on land use analysis, etc 95

Farm-city Interests—
business community supporter of conservation 75
businessmen sponsor district conservation day (Mont.) 83
city owner manages farm by field Nos 79
cooperative drainage work made life simple for growers (Mass.) 92
equipment industry supports conservation farming 95
merchant traded building for farm (Idaho) 91
professionals have high opinion of conservation 89–90
proper grassland management important to ranchers and banker (Kans.) 80

Farm-city Interests—Continued Page
result in city free of flood damage (Utah) 88–89
soil information used in city planning 77
Teamwork, Business Conservation Awards Symbolize. Curtis Loucks, Carl H. Zimmerman, and Guy Moorefield 86–87
tour of farms by city school children 81–82
Farming, Kids' Ranch Camp Outpays. Walter S. Allen 186–187
Fertilizer, liquid nitrogen (Tex.) 155
FHA—
authorized to provide long-term loans to groups for recreational developments 192
handles Rural Renewal Program 197
loan buys farm (Nev.) 41
makes loans for applying conservation practices 109
makes loans to family-farm operators for recreational developments 172
Fick, Walt of Nebraska, District Profile. C. Dale Jaedicke 286–287
FISK, ALLEN L.: Review of the Story of Dams 287
Fish, field, crawfish, starts out as native pasture (La.) 31
FLEMING, ROSE: Mississippi Farmers Cash in on Recreation 190–191
Flood(s)—
damage eliminated by watershed to Cedar City 88
damage of roads, bridges, and culverts 67
prevention project Green Creek watershed 174
Florida—
Big Cypress, a conservation nature center 281
grass in sod-based rotation 163
FLUECK, HERBERT A: Minnesota Daughters of the Soil Mark Decade of Conservation Education 138–139
Forest Service—
assisted in snow survey programing 130
concerned with water conservation 140
conservation recognition through 104
historically had recreation in its conservation 171
installed a 2-acre miniature forest exhibit at Ghost Ranch (N. Mex.) 282
provides technical assistance for conservation of Defense lands 271
will assist SCS in developing recreational facilities 192
FOSTER, ALBERT B.: Review of "After a Hundred Years" 47
FOX, LESTER: Maryland Highway Conservation Provides Scenic Recreation Spots 69–70
France, special attention to land studies and soil surveys 5
Freeman, G. Ross, started district chaplain program (Ga.) 229
FREEMAN, ORVILLE L.—
discusses the Food and Agriculture Act of 1962 172
excerpt from address before Sales Executive Club of N.Y 94
excerpt from World Food Forum 24
Multiple Use: A Concept for Private Land 48

FREEMAN, ORVILLE L.—Continued Page
signs an agreement with Defense Secretary for conservation measures on Defense lands 271
tour in 8 countries of Southern Asia 10
Fuller, Ellis, ranch showplace of complete conservation plan (Idaho) 268
FULLER, GUY C.: Birdsfoot Trefoil Conservation Discovery. With Homer E. Stennett and Paul G. Mattern, Jr 151–152

GARVER, WALTER B.: The Businessman and Conservation 75–77
Geological Survey, U.S., specialists conduct conservation trips 263
Georgia—
Broad River watershed road work saves money 268
fertilizer and lime encourage naturally seeded native plants 68
former SCS man and now reverend keeps hand in conservation 237
ministers serve as chaplains of SCD's 228
SCS training center 16
Towns Reap Watershed Benefits. James S. White, Jr 204–205
Gilbert, Emory C., Rev., says Soil Stewardship Week helpful in his church work (Ga.) 230
GILLIAM, LOUIS: City Kids Have Big Weekend on Oregon Conservation Farms. With Arthur W. Emerson 81–82
GOODLETT, W. S., JR.: 5 District Supervisors—5 Great Plains Contracts 32–33
Gordon, James, family into more profitable recreational venture (N.Y.) 112
GOTTHARD, MRS. CHARLES: NACD Auxiliary Head Lauds Conservation Work of Women 123–125
GRAETZ, KARL E.: Roadbank Revolution. With C. H. Jent 56–57
Grass(es)—
bahia sod rotation (Fla.) 163
bottom land in (S. Dak.) 271
builds up saltgrass land (Utah) 102
country (Mont.) 113
European, successful in stilling sand 246
improving range by planting (Oreg.) 162
key forage (Wash.) 28
new paper mulch method of seeding (Tex.) 211
on New Dams, New Way To Fertilize. William L. Smith 155
planted on new or reshaped road (Ga.) 269
proper management important to ranchers and bank (Kans.) 80
protection for soils (Tex.) 58–59
seeded on road back slope (Iowa) 274
Truck Crop-Berry Farm Turns To. Austin B. Summers and Olin M. Thorud 39–40
Water Conservation Bring Results. Donald N. Davison 105–106
Graves, Rolland L., of Colorado, District Profile. Herbert I. Jones 258
Greathouse, George, marshland converted to recreation pond (La.) 278
Great Plains— Page
Contract, 5, 5 District Supervisors. W. S. Goodlett, Jr 32–33
cost-sharing provisions 109
Conservation Program—
follows concept of temporary ownership 234
indication of Nation's conservation efforts 27
made use on ranch (Colo.) 222
participated in by Bobers (S. Dak.) 232
started in 1957 149
Program Drought-Proofs Ranch. Walter N. Parmeter 270–271
Swapping Cropland for Grass "Good Business" in. H. A. Wiltzen 113
Greece, much progress in soil conservation 4
GREEN, EVERETT C.: Conservation Pays Off for Oregon Rancher 161–162
GRIFFIN, ROBERT K.—
Colorado Rancher Profits By Combining Business Methods and Soil Stewardship 221–222
Roadside Erosion Control at Air Force Academy 62–63
gullies smoothed over and seeded (Calif.) 200
Guntly, John, and Charles, learn how to handle water (Calif.) 200

HALL, MRS. M. LEWIS: Clubwomen's Conservation Motto: "Do More Than Just Sit Back" 132–133
HALL, R. L.: Borrow Pit Makes Good Archery Range 283
HARRIS, CLINTON L.: FFA Boys Get Lowdown on Woodland-Range Conservation. With Thomas N. Shiflet 38
HARRISON, PHOEBE: Soil Conservation Around the World 4–5
HARTMAN, M. A.: Study Downstream Effects of Upstream Watershed Improvements. With W. O. Ree 206–207
Hawaii Land Operators Back Conservation With Dollars. Robert L. Brown 156–157
HEARD, W. L.: Ladies Are Conservation Jury 142–143
HEDRICK, CLARENCE: Conservation Program Makes Idaho Ranch Pay 267–268
HERBERT, FRED W.—
Conservation Needs Inventory Guide to County Planning 166–168
District Profile, Ezra Briggs of California 44
Highway(s)—
banks stabilized with plants (Tenn.) 56–57
conservation (D.C.). Cover picture 50
conservation measures restored scar areas 62
earth slope and cut stabilization (Tex.) 58
embankments planted to special shrubs 54–55
erosion and weed control (Idaho) 65
evolution 60
farm-type pond serving outdoor recreational needs (Md.) 70
improvement in demand (Ga.) 269
native species offered real promise in vegetation of (Ga.) 68

Highway(s)—Continued Page
plantings 245
roadside stabilization 51–53
route changed because of pilot watershed project 71
saving accomplished if soil survey report used (Okla.) 262
savings because of watershed project 257
school ground eyesore healed near 53
State Road Commission partner in small watershed program (W. Va.) 66–67
treated for erosion control and beautification (Iowa) 274
Hildner, George F., Msgr., saviour of souls and soils (Mo.) 224
Hittle, Mrs. Quentin, Sr., helps obtain irrigation information (Md.) 125
Hoffman, Paul G., excerpts from World Food Forum 24
HOIT, R. N.: Profit and Fun in Recreation Farming 185–186
Homemaking—Natural Resources Are Closely Related. Mrs. Richard S. Thompson 135–136
Honduras sent technicians to training center 16
Hood, Dan, and Mrs., turn farm into ranch camp (N.C.) 186–187
HORTIN, JOHN K.: Water on Wheels 279
Hubbard, C. R., felt important ranchers understand range management 80
Huddleston, Beecher C., of Tennessee, District Profile 158
Hudson, R. W., true steward of the soil 221–222
HUGHES, HOWARD M.: Knee-deep in Trees 45
Humbert, Dick, improves water delivery system (Colo.) 285
Hunsinger, Mrs. Carl, lives conservation 141

Idaho—
conservation can increase loan value of a farm 284
conservation profits farm-ranch operation 105–106
cooperative agreement, to eradicate weed and seed right-of-way 65
merchant traded building for farm 91
ranch plan shows a profit 267
soil conservation district identification signs 153
windbreaks reducing wind erosion 182
Illinois—
birdsfoot trefoil as a pasture legume 152
city-born priest battles for conservation 224
India—
established soil and water conservation programs 5
had most conservation trainees 7
puts everything to use 6
sent technicians to training center (Ga.) 16
72 percent of its people live on the land 10
Indonesia—
80 percent of its people live on the land 10
leads with 6 at training center (Ga.) 16
Iowa—
birdsfoot trefoil, Albia Farm 152
conservation awards of Rotary Club 86–87
Iowa—Continued Page
County Pushes Roadside Erosion Control. John G. Wilson 274–275
movie on Mule Creek watershed project 84
queens of conservation 143
Iran, 80 percent of its people live on the land 10
Irrigation—
by wheel-move sprinklers (Utah) 279
Canal Lining, $170,000 Saving Seen In. Ray H. Kerr 117
Improvement Assures Good Hay Yields. J. E. Preston 285–286
level border (Oreg.) 161
runoff reused through dugouts (Nebr.) 275
Studies, Wives Help Make. Robert A. Sidner 125
system for ranch completely revised (Idaho) 267
water, best distribution of (Nev.) 276
water management 214–215
water provided by diversion dam (Utah) 203
water savings by land leveling (N. Dak.) 208
Israel—
much progress in soil conservation 4
survey and planning adapted to SCS standards 7
Italy, much progress in soil conservation 4

JACOBSEN, MRS. ROSWELL A.: Farm Wife Finds Conservation Farming Rewarding 238
JAEDICKE, C. DALE: District Profile, Walt Fick of Nebraska 286–287
James, Mabel H., devoted advocate of conservation 129
Japan is a thriving, well-developed nation 10
JENKINS, TARLETON A.: Missouri's Conservation Priest Is Man of Many Works. With William C. Shotwell 224–225
JENSEN, MARVIN E.: Review of "Irrigation and Climate" 287–288
JENT, C. H.: Roadbank Revolution. With Karl E. Graetz 56–57
Jewish farm communities established in U.S. 232
JONES, HERBERT I.—
Conservation Nature Centers—Laboratories for Land Learning 281–283
District Profile, Captain Rolland L. Graves 258
Soil and Water Conservation Along the Main Line 254–256
Soil Surveys Save Money for City of the Alamo 77–79
Jordon, much progress in soil conservation 4

Kansas—
FFA buys bare-rooted cedars and pines 45
Frog Hollow model for large watershed 160
Grassland Management, Bankers Score in. H. Ray Brown 80–81
pilot watershed responsible for rerouting road 71
soil and water conservation sign 87
KELLER, GEORGIE A.: Audubon Classes Travel To Conservation Nature Areas 263–264

KELLEY, CLARENCE: "Twice As Many Cows Twice As Easy" — Page 28–29
KELLOGG, CHARLES E.: Soil Surveys Basic Throughout the World — 14–15
Kennedy, John F., discusses new measures that we cannot afford to postpone — 173
Kentucky—
floodwater dams. Cover picture — [196]
highway tree plantings — 245
KERR, RAY H.: $170,000 Saving Seen in Irrigation Canal Lining — 117
Keys, C. P., India puts everything to use — 6
KLEIN, W. J.: Farm Equipment Industry Invests in Soil Conservation — 84–86
KONIECZNY, EDWARD G.: Conservation Drains Spell End To "Town's" Digging Bees — 92–93
Korea sent technicians to training center — 16
Kurtz, Linda, served as SCS Administrator — 144

Land(s)—
and Water Policy Committee (USDA) — 148
concept of multiple use to private — 48
Leveling, Irrigated, Saves Water and Labor. Wayne D. Wavrin — 208–209
Now Worth Hundreds of Dollars an Acre. L. Bard Blackham — 102–103
Use, Doves and Peaches Double. Verne F. Davison — 176
LANDON, IRA K.: Soil Conservation Sticks in Taiwan and Burma — 17–18
LARSON, FRED H.: Review of "Alluvial Empire" — 216
LaSalvia, Tony, livestock-orchard unit profitable (Calif.) — 114
Latham, Bob, says contour farming helps keep soil in place (Ohio) — 34
Legume(s)—
birdsfoot trefoil long-lived (N.Y., Ill.) — 152
seed furnished by SCS — 245
sericea lespedeza and fescue provide longest lasting vegetative cover — 42
LEVASSEUR, RACHEL: First Woman Braves Snow Survey School — 130–131
Libya, much progress in soil conservation — 4
LOUCKS, CURTIS: Business Conservation Awards Symbolize Farm-City Teamwork. With Carl H. Zimmerman and Guy Moorefield — 86–87

Louisiana—
Bankers Travel Far To Study Conservation. Leon Sisk — 243–245
cattle walkways — 119
clubwomen working together could make conservation part of everyone's life — 135
conservation plan for Avery Island pepper fields — 273
marshland converted to recreation pond — 278
rice-crawfish-pasture producing edible crawfish — 31
underwater smoothing of ricelands — 158

Louisiana—Continued — Page
Upper West Fork Cypress Bayou watershed lakes also for recreation — 180–181
woodland-range management program started in 1960 by FFA chapters — 38
LOVING, ERLAND A.: Queens of Conservation — 143
LOWERY, RALPH W.: Michigan City and Farm Interests Join in Watershed—Recreation—Wildlife — 95–96
Ludwig, Sophie, known for her conservation work (Pa.) — 137
Lungren, Adam, found bentonite lining satisfactory (Wyo.) — 215

Maine County, New Aerial Portrait Helps Map. Floyd W. Campbell — 248–249
Malagasy leader in soil conservation — 4
map, aerial speeds up economic recovery (Maine) — 248
MARRERO, J. F.: Puerto Rico's Mrs. Torres Preaches—Practices Conservation — 134–135
marsh, Pymatuning and farms adjoining changed to entice waterfowl (Pa.) — 277
marshland development for waterfowl (Conn.) — 209
Maryland—
Blackwater Natural Wildlife Refuge visited — 263–264
farm challenge for a good land husbandman — 235
fishing in community pond. Cover picture — [170]
Highway Conservation Provides Scenic Recreation Spots. Lester Fox — 69–70
Lost Arrow Range good land use suited to the particular conditions — 283
Plant Materials Center initiated study of low-maintenance ground covers — 64
sponsors Upper Rock Creek watershed project — 93
thriving Accident relies on soil and water saving practices — 260
wives help make irrigation studies — 125
Massachusetts—
Air View recreation center — 280
cooperative drainage work for growers — 92
Town Conservation Commission — 183
MATTERN, PAUL G., JR.: Birdsfoot Trefoil Conservation Discovery. With Homer E. Stennett and Guy C. Fuller — 151–152
MCBAY, RAYMOND C.: From Watershed Dam To "Country Club." — 260–261
McCain, Curtis, marshland converted to recreation pond (La.) — 278
MCCALLA, T. M.: Microorganisms and Their Activity in the Soil — 36–37
MCCLELLAN, J. C.: American Tree Farm System Major Conservation Movement — 104–105
MCCONNELL, V. P.: Signs of Conservation Progress — 153
MCDOWELL, JAMES: Dugouts Save Water for Nebraska Farms — 275
McGregor, M. D., demonstrated what can be expected from good pastures on sloping land — 39
MCKEEVER, IVAN: Terracing Old Practice Goes Modern — 29–30

Page

McNamara, Robert S., signs agreement with Secretary of Agriculture for conservation on Defense lands ... 271
Mercer, Winfield, developing recreation and wildlife program ... 202
MERRILL, FREDERICK: Wildlife Conservation Farm for City Visitors ... 178–179
METZ, RUTH C.: Community Watershed Project Brings Many Benefits ... 160–161
Mexico treated for soil and water conservation ... 4
Michigan—
City and Farm Interests Join in Watershed—Recreation—Wildlife. Ralph W. Lowery ... 95–96
owner supervises management of farm in Tenn ... 79
MILLS, ROBERT: Ohio Eagle Scout Wins High Conservation Award ... 46
Minnesota—
Daughters of the Soil Mark Decade of Conservation Education. Herbert A. Flueck ... 138–139
farm wife realizes importance of proper soil management ... 238
Mississippi—
clubwomen told to give talents to conservation ... 142
Farmers Cash in on Recreation. Rose Fleming ... 190–191
Holophia Creek watershed visited by trainees ... 9
Missouri Conservation Priest Is Man of Many Works. Tarleton A. Jenkins and William C. Shotwell ... 224–225
MONK, MARION S., Jr.: Conservation Districts Watch Soil Stewardship Week Grow ... 219–221
Montana—
businessmen sponsor district conservation day ... 83
farmer swapping cropland for grass profitable ... 113
RR travelers see Lower Willow Creek watershed ... 225
scene of remedial drainage improvement ... 150
water situation improved ... 212
water-supply forecasts important in supervising and constructing dams ... 111
MOOREFIELD, GUY: Business Conservation Awards Symbolize Farm-City Teamwork. With Curtis Loucks and Carl H. Zimmerman ... 86–87
Mormons Soil-Water Stewards for More Than a Century. John Bradshaw and Norma Yourchik ... 239–240
MOUSTAKIS, CHRISTOPHER G.: Conservation Contractor Converts Idle Land To Recreation Center ... 280–281
Multiple Use: A Concept for Private Land. Orville L. Freeman ... 48
MURRAY, Glen E.: Intensive Pasture Management Pays ... 35
MYERS, ROBERT E.: Campsite Outpays Cattle ... 112
MYRICK, SUSAN: Recreational Sites Key Phase of Conserving Soil ... 177–178

NACE, WILLIAM W.: By Accident and By Design ... 259–260
Nationalist China—
established soil and water conservation ... 5
sent technicians to training center (Ga.) ... 16
Navy Department helped initiate a study of low-maintenance ground covers ... 64
Nebraska—
Farms, Dugouts Save Water for. James McDowell ... 275
erosion control structures replace bridges ... 118
family enjoys new recreation area ... 43
Upper Salt-Swedeburg watershed participated in by RR ... 255
Walt Fick, District Profile ... 286–287
Negro farm pays through conservation plan ... 235–237
NEU, ALBERT: Windbreaks Cut Erosion—Are Boone To Wildlife ... 182–183
NEUBAUER, T. A.: Review of "Design of Regional Accounts." ... 119
Nevada—
Girls' Nation delegate Linda Kurtz ... 144
land reclaimed, conservation farm plan ... 41
snow-surveying based water forecasts benefits ... 11
soil survey publication in planning for soils uses, water distribution, and taxes ... 276
water situation declined ... 212
New Hampshire—
Ash Swamp Brook watershed yielding dividends beyond flood prevention ... 198
Oliverian Brook watershed offers highway and recreational facilities ... 256
New Jersey, first Jewish agricultural school ... 232
New Mexico—
Ghost Ranch, growing interpretive center ... 281
professionals have high opinion of conservation ... 89–90
snow survey cooperator ... 111
New York—
address by Orville L. Freeman before Sales Executive Club ... 94
Bear Mountain, conservation nature center ... 281
birdsfoot trefoil stands a wide variety of conditions ... 152
farm becomes more profitable recreational venture ... 112
Woman Is Conservation Leader. Homer E. Stennett ... 129–130
New Zealand—
conservation work. Cover picture ... [2]
districts beset by difficult problems of wildlife ... 20
treated for soil and water conservation ... 4
Nobbe, Orville, developed a pond and recreation area (Nebr.) ... 43
NORMAN, THEODORE: Jewish Farmers' Soil Stewardship Interest Inherited From Ancient Times ... 232–233
Norona, Gaston, first foreign trainee to attend training center (Ga.) ... 16
North Carolina—
Children's Museum, conservation nature center ... 281
dedication to first district cooperator ... 168
ranch camp for kids ... 186

North Carolina—Continued Page
roadside erosion control, Muddy Creek watershed 61
site of first soil conservation district 72
North Dakota—
land leveling 208
The Smoker (conservation) sponsored by community 86
Notestein, Frank W., excerpts from World Food Forum 24

Ohio—
Aullwood Nature Center 281
conservation pays. Cover picture [98]
Eagle Scout Wins High Conservation Award. Robert Mills 46
Hammertown Lake watershed runoff handled by lake 201
Mennonite supply preacher helped organize SCD 226
movie scene from Upper Hocking watershed project 84
school project serves as an arboretum 54
two renovated farms billed as "Second Frontier" 33–34
wildlife conservation farm 178–179
wildlife packet started by SCD 189
woman lives conservation 141
Oliver, William B.: Alaska—Last Conservation Frontier 164–166
Oklahoma—
bankers conservation tour 243
Big Wewoka Creek work protects RR bridge 255
soils of 30 counties surveyed 262
Washita River watershed mainstems effect studied 206
Oregon—
Conservation Farms, City Kids Have Big Weekend on. Louis Gilliam and Arthur W. Emerson 81–82
farm operated according to conservation plan 39
sand dune erosion control 246
Vanport destroyed in minutes by flood 126
water situation declined 212
water-supply forecasts make possible to plan in advance 111

Packer, Robert J.: Conservation Ground water Control Rescues County Road 150–151
Pakistan—
80 percent of its people live on the land 10
established soil and water conservation program 5
organized snow survey program 22–23
Paper Mulch Helps Grass Grow on Dams. William L. Smith 211
Parks, Merritt, said he is using improved soil and water management (Oreg.) 161
Parmeter, Walter N.: Great Plains Program Drought-Proofs Ranch 270–271
Partain, Lloyd E.: Recreation Brings New Opportunities To Rural America 171–174

Pasture(s)— Page
and Livestock Boost Farm's Income a Third. Lester Solomon 101–102
grass and clover mixtures used (Oreg.) 39
Intensive Management Pay$. Glen E. Murray 35
Peavy, Billy S.: Planning for Conservation Pays, too! 114–115
Pennsylvania—
conservation progress. Cover picture [146]
Crooked Creek watershed 154
Pymatuning wildlife refuge 277–278
rural community. Cover picture [74]
terracing practiced for first time 29
wife known for her conservation work 137
Phelps, Grove, conservation boosts profitableness of his diversified operation 105
Philippine Republic, leader in soil conservation 4
Philippines—
sent 5 to training center (Ga.) 16
visited by Secretary and staff 10
Phillips, Mrs. Robert J.: League of Women Voters Promote Political Action for Conservation 139–140
Plant(s)—
Basal, Density Guide To Protecting Highways. William L. Smith 58–59
Better, for Raw Banks. R. B. Thornton and C. L. Williams 63–64
Fertilized Native, Promise Roadbank Protection. E. C. Richardson and E. G. Diseker 68–69
from seed grown along highway system (Conn.) 54–55
materials technicians used Bober lands for trials of grasses and legumes 232
Old, Plays New Role. A. D. Williamson and E. R. Simmons 42–43
tested on highway banks (Tenn.) 56–57
Poland soil and water conservation research 5
Pond(s)—
Bentonite, Lining Solves Water Problem. Jack Wiese 215–216
converted from marsh for recreation (La.) 278
dugout made into recreation area (Mass.) 280
(dugouts) used for fishing and duck-hunting 275
Farm, Family and Neighbors Enjoy. Waldo H. Rodene 43
for wildlife (Pa.) 278
profitable for recreation (Miss.) 190
serving outdoor recreational needs (Md.) 70
Portugal, special attention to land studies and soil surveys in overseas colonies 5
Preston, J. E.: Irrigation Improvement Assures Good Hay Yields 285–286
Price, Gordon J.: Tailor Made—Clothing and Conservation 91
Priest, John E.: Snow Surveys in Pakistan 22–23
Profile, district—
Ezra Briggs of California. Fred W. Herbert 44
William Wilson Campbell of Arkansas. Howard T. Barnett 115–116
Walt Fick of Nebraska. C. Dale Jaedicke 286–287

Profile, district—Continued — Page
Captain Rolland L. Graves of Colorado. Herbert I. Jones — 258
Beecher C. Huddleston of Tennessee. Leonard W. Davis — 158
Public Roads, Bureau of—
checked on a selected sample basis engineering section in published surveys — 262
initiated cooperative demonstration for study of highway erosion — 51
launched formal pilot erosion control in cooperation with SCS — 60
Puerto Rico woman soil conservation leader — 134

QUACKENBUSH, TYLER H.: Irrigators' Management Key To Water Saving — 214–215

Recreation—
adds income to watershed landowners (Tex.) — 174
and urbanization resulted from sand dune control (Oreg.) — 248
area on farm in watershed development (Tex.) — 260
Brings New Opportunities To Rural America. Lloyd E. Partain — 171–174
developed on Hammertown lake (Ohio) — 202
Farming, Profit and Fun In: R. N. Hoit — 185–186
fishing in community pond, Md. Cover pic — [170]
for town from pond (Md.) — 260
from borrow pit made into archery range — 283
from converted marshland paying proposition — 278
from highway farm-type pond (Md.) — 70
from lakes of Little Tallapoosa River watershed (Ga.) — 204
from reservoirs on Six Mile Creek watershed — 188
long nature trail made of parcels of land for (Mass.) — 184
made from idle land (Mass.) — 280
most profitable use of some farmland (Mass.) — 190
needs studied by council (Mich.) — 95
on Frog Hollow watershed (Kans.) — 161
on Rodman and Latham ponds (Ohio) — 34
ranch camps for kids (N.C.) — 186
returns from watershed project (N.H.) — 256–257
Sites Key Phase of Conserving Soil. Susan Myrick — 177–178
USDA Moves Ahead On. John A. Baker — 192
venture more profitable than cattle business — 112
watershed lakes used for (La.) — 180–181
REE, W. O.: Study Downstream Effects of Upstream Watershed Improvements. With M. A. Hartman — 206–207
Research Series—
No. 68. Microorganisms and Their Activity in the Soil. T. M. McCalla — 36–37
No. 69. Fertilized Native Plants Promise Roadbank Protection. E. C. Richardson and E. G. Diseker — 68–69
No. 70. Study Downstream Effects of Upstream Watershed Improvements. M. A. Hartman and W. O. Ree — 206–207
Resource conservation and development projects — 197

Reviews— — Page.
After a Hundred Years. The Yearbook of Agriculture — 47
Alluvial Empire. By Robert W. Harrison — 216
Comparisons in Resource Management and Their Possible U.S. Application. Edited by Henry Jarrett — 47
Design of Regional Accounts. Edited by Werner Hochwald — 119
Diseases of Turfgrasses. By Houston B. Couch — 287
A History of Land Use in Arid Regions. Edited by L. Dudley Stamp — 23
Irrigation and Climate. By Henry Olivier — 287–288
Land Economics Research. Edited by Joseph Ackerman, Marion Clawson, and Marshall Harris — 120
The Story of Dams. By Peter Farb — 287
Riceland Smoothing—Under Water. Chester F. Bellard — 158–159
RICHARDSON, E. C.: Native Plants Promise Roadbank Protection. With E. G. Diseker — 68–69
RICHASON, BENJAMIN, F., JR.: Student Geographers-Farmers Study Conservation From the Air — 250–251
RIDENOUR, WILLIS J.: Watershed Conservation Insures City Water Supply — 201–202
Roadbank Revolution: Karl E. Graetz and G. H. Jent — 56–57
Roadside—
Erosion Control at Air Force Academy. Robert K. Griffin — 62–63
Improvement, VIPs for. Bernhard A. Roth — 54–55
Problem, Pesky Weeds Licked as. Robert F. Tegner — 65–66
RODENE, WALDO H.: Family and Neighbors Enjoy Farm Pond — 43
Rhodesian Federation treated for soil and water conservation — 4
Rodman, John, contour farming really pays off — 33
ROGERS, J. B.: Training for Conservation in Many Lands. With Lee B. Shields — 7–8
Roper, William, traded Jerome building for farm (Idaho) — 91
ROSS, WILLIAM: Conservation—A Profitable Way of Life — 284–285
ROTH, BERNHARD A.: VIPs for Roadside Improvement — 54–55
Rural—
areas—
benefit from watershed project (N.H.) — 199
development helped by aerial mapping — 248–249
Development Program — 148
followed by SCD (Ohio) — 227
indication of Nation's efforts — 27
economy increased by Little Tallapoosa River watershed (Ga.) — 204
in Pennsylvania. Cover picture — [74]
lakes owned by city for recreation (La.) — 180
Renewal Program new tool — 197

Salsbery, Louis B., swapping cropland for grass profitable (Mont.) — 113

Page

[Sand] Dune Erosion Control—Battle Against the Sea. Robert F. Tegner ... 246–248
SANDERS, R. W.: Keys Key Conservation to Worldwide Peace Hope ... 6–7
SARTAIN, LILLIAN P.: Town Conservation Commission New Resource Tool ... 183–184
The "Second Frontier" Today. Emil E. Ebert ... 33–34
Seegmiller, George H., farm now worth several hundred dollars an acre (Utah) ... 102
SENTERFITT, J. H.: "Sod-busting" the Conservation Way. With H. E. Van Arsdall ... 163
Sharpe, J. C., turned farm into Dizzy-Land ... 185–186
Sheriff, Willie G., never lets bare land from new construction (Ga.) ... 269
SHIELDS, LEE B.: Training for Conservation in Many Lands. With J. B. Rogers ... 7–8
SHIFLET, THOMAS N.—
FFA Boys Get Lowdown on Woodland-Range Conservation. With Clinton L. Harris ... 38
Primrose Path for Beef Cattle ... 119
SHOTWELL, WILLIAM C.: Missouri Conservation Priest Is Man of Many Works. With Tarleton A. Jenkins ... 224–225
SIDNER, ROBERT A.: Wives Help Make Irrigation Studies ... 125
SIMMONS, E. R.: Old Plant Plays New Role. With A. D. Williamson ... 42–43
SISK, LEON J.—
Conservation Safeguards Historic Pepper Fields ... 272–273
Louisiana Bankers Travel Far To Study Conservation ... 243–245
SLATON, CHARLES—
Conservation Land Patterns Draw Migratory Waterfowl ... 277–278
Conservation Progress Stirs Pennsylvanians' Memories ... 154–155
SCD Director's Wife Is Conservation Salesman ... 137
Smith, Ed, established windbreak on farm ... 182
SMITH, GORDON S.—
Watershed Project Brings Flood-Free Highway ... 256–257
Watershed Project Brings Many Community Rewards ... 198–200
Smith, John, became first soil conservation district director (Pa.) ... 154
Smith, Ray, has one of finest pasture stands ... 29
Smith, Richard, worked out a complete conservation farm plan (Md.) ... 236
SMITH, WILLIAM L.—
Basal Plant Density Guide To Protecting Highway ... 58–59
New Way To Fertilize Grass on New Dams ... 155
Paper Mulch Helps Grass Grow on Dams ... 211
Snow survey(s)—
forecasts ... 212–213
in West Pakistan. John E. Priest ... 22–23
Mean Dollars for Agriculture and Industry. Robert F. Tegner ... 110–111
reports warn drought on way (Utah) ... 279
training school had first woman (Colo.) ... 130
Soil(s)—
and Water Conservation Along the Main Line. Herbert I. Jones ... 254–256
and Water Conservation, the Broadening Challenge of. Donald A. Williams ... 27
Conservation Around the World. Phoebe Harrison ... 4–5
Conservation Sticks in Taiwan and Burma. Ira K. Landon ... 17–18
Microorganisms and Their Activity in the. McCalla, T. M ... 36–37
steward of (Colo.) ... 221
Stewardship—
by farm wife (Minn.) ... 238
Cover picture (Wis.) ... [218]
Is Key to Land and Water Use. T. S. Buie ... 233–235
Interest Inherited From Ancient Times, Jewish Farmers'. Theodore Norman ... 232–233
of the ministry ... 237
practiced by Catholic priest (Mo.) ... 224–225
preached and practiced by Mennonite supply preacher (Ohio) ... 226
Sunday observed by Mormon Church (Utah) ... 240
Week Grow, Conservation Districts Watch. Marion S. Monk, Jr ... 219–221
Week practiced by SCD (S.C.) ... 223–224
work stimulating district chaplains report ... 228
Soil Conservation District(s)—
about 80% of all Mormon Church farms in ... 239
Ashtabula starts wildlife packet ... 189
Association sponsors Soil Stewardship Week ... 219–221
auxiliarist forwarding soil and water conservation work ... 123
board members have GPCP contract ... 33
Chaplains, Ministers Spread Stewardship Message As. Walter S. Allen ... 228–230
Clerk Does Conservation Homework. Curtiss O. Steele ... 141
comparison among Canada, New Zealand, and U.S ... 20
Cooperator F. Y. Sorrell dedication (N.C.) ... 168
Day, Businessmen Sponsor. Don Tootell ... 83
Director's Is Conservation Salesman. Charles Slaton ... 137
expand to 60 districts (Pa.) ... 154
help in tree program (Idaho) ... 183
helps install drainage measures (S.C.) ... 223
historical marker of first (N.C.) ... 72
irrigation water management in Redlands-Highland ... 214
organization encouraged by chambers of commerce ... 75
program ... 148
program indication of Nation's conservation efforts ... 27
SCS study confirms local money used for program of ... 109
sign preserved (Tex.) ... 153
sponsor recreation (Ark.) ... 189
update program to fit rural areas development (Ohio) ... 227

Soil Conservation Service— Page
assigned leadership and responsibility in "Income-Producing Recreation Enterprises on Rural Non-Federal Lands" 172
concerned with water conservation 140
conservation recognition through 104
cooperated on soil erosion along highways 51
coordinates snow survey and water-forecasting activity in 11 Western States 110
furnished seed for trial plantings 245
furnishes technical help on cropland conversion program 197
guides snow surveying 130
helped launch formal pilot erosion control project 7–8
participates in training programs in this country for foreign trainees 7–8
provides—
technical assistance for conservation measures on Defense lands 271
technical assistance on income-producing recreational activities 192
technical help, Upper Rock Creek watershed 93
technical help through 16 SCD's (Hawaii) 156
scientists have placed monoliths and soils exhibit at Ghost Ranch (N. Mex.) 282
specialists conduct conservation trips 263
study confirms local money used for SCD program 109
technicians advise district landowners and operators 234
works with farm equipment industry 84
Soil Survey(s)—
Basic Throughout the World. Charles E. Kellogg 14–15
Basis for Land Assessments. Leonard A. Anker 276
completed for more than a decade (Alaska) 165
Help Engineers Build Better Roads at Lower Cost. Louis E. Derr 262–263
improves Washington land 28
Save Money for City of the Alamo. Herbert I. Jones 77–79
supply acreage suitability for urban needs (Mass.) 183
SOLOMON, EUGENE E.: Economical Erosion Control Structures Replace Expensive County Bridges 118
SOLOMON, LESTER: Pasture and Livestock Boost Farm's Income 101–102
Sorrell, F. Y., first district cooperator 168
South Africa Republic treated for soil and water conservation 4
South America treated for soil and water conservation 4
South Carolina—
browntopmillet food for doves 176
district supervisor believes modern conservation could help other nations 6
Horry SCD applies conservation measures 223
South Dakota— Page
"black blizzard" roamed through Plains States 126
Jewish farmer 232
one of the outstanding conservation programs in the country 60
ranch profits from GPCP 271
trains now safely pass over trestle (Silver Creek small-watershed) 255
Southern Rhodesia sent technicians to training center (Ga.) 16
Spain—
Conservation Program Makes Rapid Strides. R. M. Elizalde 12–13
much progress in soil conservation 4
one of the world's newest soil conservation programs 5
sent technicians to training center (Ga.) 16
Splane, Peyton, E., Jr. Rev., keeps hand in conservation 237
Sport Fisheries and Wildlife, Bureau of—
helps stock pond with bass and bluegills 43
specialists conduct conservation trips 263
Stach, Mrs. Charles, helps obtain irrigation information (Md.) 226
Stauffer, William H., Rev., preaches soil and water conservation (Ohio) 226
STEELE, CURTISS O.: S.C. District Clerk Does Conservation Homework 141
STENNETT, HOMER E.—
Birdsfoot Trefoil Conservation Discovery. With Paul G. Mattern, Jr., and Guy C. Fuller 151–152
New York Woman Is Conservation Leader 129–130
STEPHEN L. TURNER: He Practices Conservation In "Partnership With God." 226–227
Stephens, John, aided in getting first SCD started (Pa.) 154
Sudan trainees obtained practical soil conservation work 7
SUMMERS, AUSTIN B.: Truck Crop-Berry Farm Turns To Grass. With Olin M. Thorud 39–40
SWENSON, EDWIN A.: Waterfowl Marsh Developments Catch on in Connecticut 209–210
Symington, Stuart, excerpts from World Food Forum 24

Taiwan developed soil conservation program 17–18
TEGNER, ROBERT F.—
Dune Erosion Control—Battle Against the Sea 246–248
From Swimming Champion to Conservation Farmer 127–128
Pesky Weeds Licked as Roadside Problem 65–66
Snow Surveys Mean Dollars for Agriculture and Industry 110–111
Tennessee—
farm changed to livestock increased income 101
farm managed from Michigan 79
highway tree plantings 245
Beecher C. Huddleston, District Profile 158

Tennessee—Continued Page
legumes and grasses dot highways 56
SCS man and Methodist supply minister preaches saving both soil and souls 237
Terracing, Old Practice Goes Modern. Ivan McKeever 29–30
Texas—
bankers conservation tour 243
GPCP contract provides for complete conservation program 32
Hudson's younger years on ranch 221
liquid nitrogen 155
NACD preserves Idaho conservation district sign 153
paper mulch for grass seeding 211
RR on Madden Arroyo watershed rerouted 255
San Antonio uses soil surveys 77–79
techniques to promote growth of grass on damsites 58
Trinity River watershed site of golf club 260
Watershed Project Yields Bonus in Fun-Landowners' Income. David O. Davis 174–175
Thailand—
farmers never able to use fertilizer because they couldn't afford it 11
had 11 conservation trainees 7
sent technicians to training center (Ga.) 16
THOMAS, CARL H.—
"Crawdads" Are Crayfish and Vice Versa 31
$30 an Acre Fishing Profits From Once Useless Wetland. With John Cross 278
THOMPSON, MELVIN M.: Asia's Golden Rain Tree Goes to College 21
THOMPSON, MRS. RICHARD S.: Homemaking—Natural Resources Are Closely Related 135–136
THORTON, R. B.: Better Plants for Raw Banks. With C. L. Williams 63–64
THORUD, OLIN M.: Truck Crop-Berry Farm Turns To Grass. With Austin B. Summers 39–40
TOOTELL, DON: Businessmen Sponsor Annual SCD Day 83
Torres, Rosa, Mrs., soil conservation leader 134
tour of Louisiana bankers 243–245
Tree(s)—
American, Farm System Major Conservation Movement. J. C. McClellan 104–105
Golden Rain, on campus (Mo.) 21
Knee-Deep in. Howard M. Hughes 45
planting(s)—
along State highways 245
of farmlands (Idaho) 183
packet for wildlife (Ohio) 189
Scotch Broom and Shore Pine effective for sand dunes (Oreg.) 247
wood-using industries getting hill farmers to plant (Ark.) 107
Tunisia receives direct technical aid from U.S. 8
Turkey—
had most conservation trainees 7
much progress in soil conservation 4
sent technicians to training center (Ga.) 16
TURNER, STEPHEN L.: He Practices Conservation in "Partnership With God" Page 226–227

Uchida, Ken, uses wheel-move irrigation sprinklers (Utah) 279
Urban—
and farmer groups recognize conservation 86–87
land soil surveyed (Tex.) 78
Urbanization—
activities cause of the erosion (Ohio) 54
areas use for wildlife packets (Ohio) 189
means farm can't be kept in agriculture 128
USDA Graduate School courses with Audubon Society 263–264
USSR incorporates soil and water conservation practices 4
Utah—
company lined canal with concrete 117
cooperator sets pasture operation for many farmers 35
farmer goes all out with sprinklers 279
Green's Lake watershed eliminates flood damage to city 88
Irrigators Lick Water Losses. Don L. Braithwaite 203
Mormon Church farms in 239
saltgrass land built up by grass 102
water situation declined 212
water-supply forecasts influence overall management policy 111

VAN ARSDALL, H. E.: "Sod-busting the Conservation Way. With J. H. Senterfitt 163
VAN DERSAL, WILLIAM—
Review of "Comparisons in Resource Management and Their Possible Application" 47
3 Ways To Conservation, Canada, New Zealand, United States 19–20
Venezuela, greater yields incentive for soil conservation 5
Virginia—
natural regions 263
sericea lespedeza stabilizes structures 42

WALKER, ROBERT T.: Federal and State Road Agencies Battle Erosion 51–53
Wallace, Henry A., excerpts from World Food Forum 24
Washington—
first woodland owner certified "tree" farmer 104
good land use on breaks of Snake River 28
Water—
all falls on the land 195
conservation, world 4–5
conservation as across-the-board operation resourcewise 27
dam for diverting (Utah) 203
irrigation, applied by border method (Utah) 35
irrigation, savings by land leveling 208
management begins on privately owned land 195
On Wheels. John K. Hortin 279
problem solved by bentonite pond lining 215–216

Water—Continued Page
Saving, Irrigators' Management Key To. Tyler H. Quackenbush 214-215
Snow. R. A. Work 212-213
supply increased for Jackson (Ohio) 201
Watershed(s)—
Community, Project Brings Many Benefits. Ruth C. Metz 160–161
Conservation Insures City Water Supply. Willie J. Ridenour 201–202
Dam To "Country Club." Raymond C. McBay 260–261
Dams Provide Better County Roadways. C. W. Chapman 268–269
directly benefit railroads and vice versa 255
end product, recreation for small 171
Green Creek, gained lakes for recreation 174
Kalamazoo Valley acres for waterfowl 95
Lakes Bring Benefits Galore To Louisiana's Bayou Area. John Cross and Joe Colvin 180–181
Lands and Water Are Everybody's Concern. Donald A. Williams 195–197
Little Youghiogheny River project dams 259
program indication of Nation's conservation efforts 27
Project(s)—
Brings Flood-Free Highway. Gordon S. Smith 256–257
Brings Many Community Rewards. Gordon S. Smith 198–200
County Builds Road To Serve. Roy M. Davis 71
opened way to still broader conservation contributions by business 75
Saves Cedar City Dollars. Leland H. Carlson 88–89
Ranch, Job Pays Dividends. Robert Dellberg 200–201
Reservoirs Draw Paying Customers. Sellers G. Archer 188–189
roadside erosion control established on Muddy Creek (N.C.) 61
Skipanon sponsored by Warrenton Dunes SCD 248
small, program, State Road Commission a partner of (South Fork and Patterson Creek, W. Va.) 66–67
small, projects sponsoring group may obtain cost-sharing assistance 192
Study Downstream Effects of Upstream Improvements. M. A. Hartman and W. O. Ree 206–207
Trinity & Upper Washita, paper mulch trials on (Tex.) 211
Trinity River, used for applying liquid nitrogen (Tex.) 155
Upper Rock Creek sponsored by D.C. and Maryland 93
WAVRIN WAYNE, D.: Irrigated Land Leveling Saves Water and Labor 208–209
Weather Bureau, U.S., specialists conduct conservation trips 263
Webb, Murray, sets pasture operation pattern for many farmers (Utah) 35
West Virginia—
conservation measures. Cover picture [267]
prosperous beef cattle farm. Cover picture [26]
Road Commission Sets Conservation Pattern. Norris R. Caryl 66–67
Wetlands, $30 an Acre Fishing Profits From Once Useless. Carl H. Thomas and John Cross 278
WHITE, JAMES S., JR.: Georgia Towns Reap Watershed Benefits 204–205
WIESE, JACK: Bentonite Pond Lining Solves Water Problem 215–216
Wildlife—
acres bought for waterfowl and games 95
area from wooded pasture (Nebr.) 43
Avery Island, La., managed for 273
browntopmillet for doves (S.C.) 176
conservation (Oreg.) 162
Conservation Farm for City Visitors. Frederick Merrill 178–179
enticed to marshes and farmlands (Ga.) 277–278
facilities near home (Ga.) 178
food and shelter provided by odd-area plantings (Idaho) 182
increased by watershed project (N.H.) 199
marshes (Conn.) 209–210
New Hope for Urban Area. James S. Bennett 189–190
program developed on Hammertown lake 202
WILKIN, ELLA P.: Conservation on Defense Lands 271–272
WILLIAMS, C. L.: Better Plants for Raw Banks. With R. B. Thornton 63–64
WILLIAMS, DONALD A.—
The Broadening Challenge of Soil and Water Conservation 27
Conservation for Better Roads Moves Ahead 60–62
Conservation Is International 3
Economic Factors Essential in Sound Conservation Program 108–109
True Measure of Conservation Progress 147–149
Watershed Lands and Water Are Everybody's Concern 195–197
WILLIAMS, RUTH: "Women in Conservation Are Doing Their Part" 126–127
WILLIAMSON, A. D.: Old Plant Plays New Role. With E. R. Simmons 42–43
WILSON, JOHN G.: Iowa County Pushes Roadside Erosion Control 274–275
Wilson, Michael L., wins Hornaday Award highest scouting recognition in conservation 46
WILTZEN, H. A.: Swapping Cropland for Grass "Good Business" in Great Plains 113
Windbreaks Cut Erosion—Area Boon To Wildlife. Albert Neu 182–183
Wisconsin—
rural landscape as seen from the air 250
soil stewardship. Cover picture [218]

Women— Page
called on to make conservation contest a success (Iowa) 143
clubs are conscious of good farming measures (Miss.) 142
clubs resolution covers all phases of conservation 132
everywhere should be aroused about conservation (La.) 135
farm wife realizes importance of proper soil management (Minn.) 238
First, Braves Snow Survey School. Rachel Le Vasseur 130–131
help make irrigation studies (Md.) 125
in conservation (Colo.). Cover picture [122]
in Conservation Are Doing Their Part. Ruth Williams 126–127
leaders in conservation from Girls Nation 144
like Mrs. Hunsinger live conservation 141
like Sophie Ludwig known for her conservation work (Pa.) 137
NACD Auxiliary Head Lands Conservation Work of. Mrs. Charles Gotthard 123–125
Rosa Torres soil conservation leader 134
rural, known as "The Minnesota Daughters of the Soil" 138
swimming champion now a conservationist 127
teaching others to become conservationist 129
Voters, League of, Promotes Political Action for More Conservation. Mrs. Robert J. Phillips 139–140
Woodland, Range Conservation, On, FFA Boys Get Lowdown. Thomas N. Shiflet and Clinton L. Harris Page 38
WORK, R. A.: Snow Water 212–213
World Food Forum 24
WRENN, ELDON: Japanese Conservation Success Story 40–41
Wynkoop, Ernest, tells of his conservation experience (N. Mex.) 89
Wyoming woman enrolled in snow survey training school 130

Yamashita, Kiyoshio and Roy, build farm out of salt-saturated land (Nev.) 40
YOUNG, GLADWIN: Education and Skills Key To World Resources 10–11
YOURCHIK, NORMA: Mormons Soil-Water Stewards for More Than a Century. With John Bradshaw 239–240
Yugoslavia—
has active conservation program 5
sent technician to training center (Ga.) 16
soil and water conservation advanced through trainees 9
YUSK, STANLEY: Field Number Signs Solve Conservation Management by Mail 79

ZIMMERMAN, CARL H.: Business Conservation Awards symbolize Farm-City Teamwork. With Curtis Loucks and Guy Moorefield 86–87

U.S. GOVERNMENT PRINTING OFFICE:1964